AMERICAN AGRICULTURIST

FOR THE

FARM · GARDEN · & · HOUSEHOLD

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

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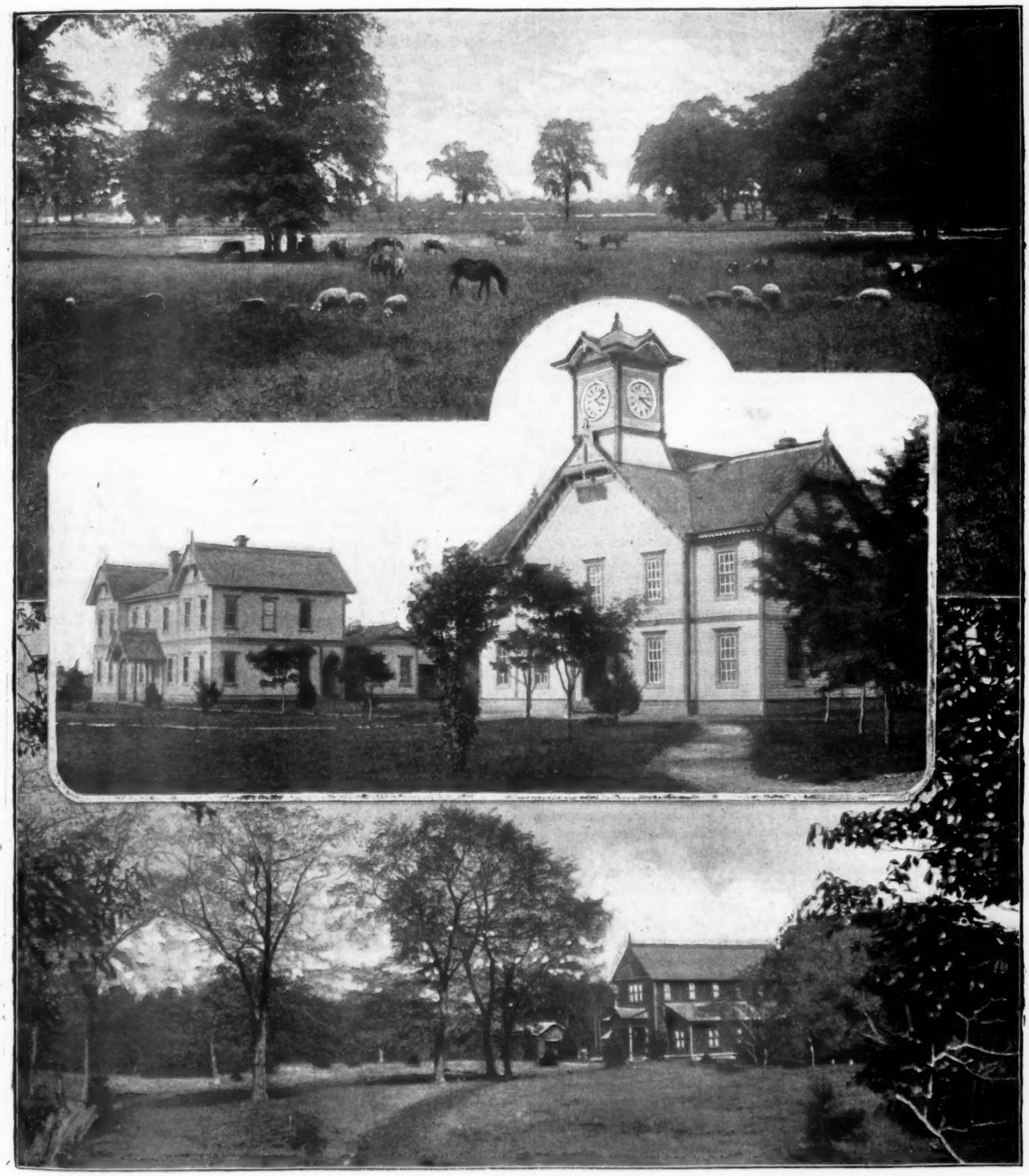

VIEWS OF THE AGRICULTURAL COLLEGE AND FARM AT SAPPORO, JAPAN.

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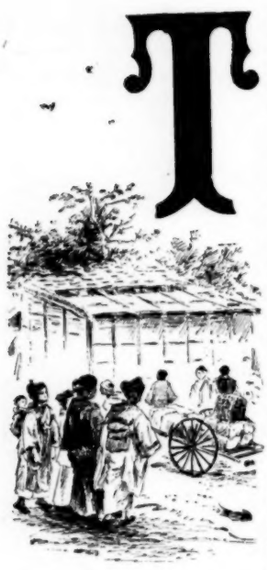
A JAPANESE COLLEGE OF AGRICULTURE.

INAZO NITOBE, SAPPORO, JAPAN.



THE Imperial College of Agriculture at Sapporo, Japan, is of more than usual interest to the farmers of America, not merely on account of the character of the instruction given there, but also because of the American influences which played an important part in establishing it. Sapporo lies in the fertile valley of the Ishikari, the largest river in Japan, and on the banks of the Toyohira, the Ishikari's worthy tributary. It is the capital of the northern and colder island, Hokkaido, formerly called Yesso, a large portion of which has only recently been colonized from the warmer southern islands. American and European crops have been introduced. All the usual garden vegetables do well. Potatoes, corn and cabbage have become popular articles of diet, although they were entirely unknown to the Japanese a few years ago. The corn is usually dipped in shoyu, a sauce made from beans, and roasted over a brazier; the cabbages are pickled in salt, or boiled. Sugar beets do so well that two large factories were built on the island, the machines and experts to set them up and run them being brought over from Germany. Grains and grass of all kinds grow luxuriantly, more especially American corn and oats among the former, and timothy and red-top among the latter. Several European or Western fruits grow and bear abundantly. We have large, delicious cherries and plums, while apples are justly the pride of the island. All the smaller fruits do well excepting blackberries, for the full perfection of which the summer is rather short. The same may be said of the grape, as frequent rains in September of most years, prevent them from obtaining the rich flavor one desires in eating them uncooked. However, an extensive vineyard near Sapporo supplies a large quantity of the varieties used in wine-making. In the College barn, Shorthorns, Guernseys and Jerseys are kept. The milk supply of Sapporo is considered the finest in Japan as regards quality, this being chiefly due to the influence of the College farm. Butter, also of good quality, is made in the farm creamery.

Respecting the curriculum of the College, it has seen many changes in the course of the past seventeen years. At first, a large number of subjects not directly connected with agriculture were taught; English elocution, drawing, history and mental philosophy. Most of these are now relegated to the Preparatory Department, while the curriculum of the College proper has been advanced and so specialized that, outside of the Department of Engineering, which holds its own important place in the work of the institution, and apart from the military drill imposed upon the students several afternoons of each week, only such studies are pursued as are closely related to agriculture. The chief branches of instruction as at present given, are physiological and cryptogamic botany, vegetable histology and pathology, organic and agricultural chemistry, zoology and fishery, entomology and sericulture, veterinary medicine and practice, agricultural economics and politics, history of agriculture and of colonization. Experiment plots are assigned to each student upon which to demonstrate given propositions.

Connected with the College farm is a course of instruction termed the Practical Course, designed in the interest of pioneer farmers, and of such young men as wish to become colonists, and who are not prepared for full matriculation in the College. In addition to the regular farm work, these pupils receive occasional lectures upon the elements of political economy, upon chemistry and foods, and upon house industries; even a knowledge of bread making and sandal making possessing a greater value for the colonist than may at first appear. The faculty of the College is composed of twenty-nine professors and instructors, of whom four are exclusively engaged in the Engineering Department. There is at present only one foreigner upon the staff, the Professor of Western Agriculture. The other professors, assistant professors and lecturers are all Japanese. Several of them studied abroad, having gained doctorate degrees in leading American and German universities. The number of students in the College proper is now about sixty; but in the Preparatory Department there are more than one hundred and sixty, while nearly forty young men are taking the Practical Course. Altogether, the College has two hundred and seventy-four students under its jurisdiction. The importance of the College at Sapporo will become clear only when the agricultural resources of Hokkaido are made known, and can, indeed, only be realized by learning how different are the physical aspects of this region from those of the rest of the Empire, and how, therefore, its agriculture and its social life, its dwelling houses and the dress of its people, must differ from the customs of the southern islands. In one word, how new a social and industrial state of things must be developed in this northern island of Japan. [Views of the Sapporo Agricultural College and farm are presented in our frontispiece.]

HOW LATE SHOULD CORN BE CULTIVATED?

FRED GRUNDY, ILLINOIS.

Of twenty-seven fairly prosperous farmers to whom the above query was sent, six gave very nearly the same answer, and these six were the most uniformly successful corn growers among them. Of the others, seven had a set rule, two were guided largely by the signs of the zodiac, while the remainder were governed by the amount of other work on hand and various other conditions. The two who had made the most money growing this cereal, managed it so nearly alike that one would almost be led to believe they had been reared on the same farm, while, in fact, they were not even acquainted with each other.

These two men have grown corn for thirty-five and thirty-seven years, respectively, and in all that time have not failed to get a fair crop, and good, sound seed every season. They regard every season as bad, until it proves itself to be good, and they always prepare for a bad season by planting two or three acres of very rich, well-drained land as early as the soil can be well fitted for the seed, and taking the best of care of the crop. In 1892, when large sections of land were so flooded with rains that scarcely any corn was planted before June, these two men had small tracts planted early in May and doing fairly well under the circumstances. The land was well tile-drained, while open furrows carried off all the water from the surface as fast as it fell. Whenever it was possible to work the soil, it was stirred with cultivators, and the hills were well hoed. The result was that when fine weather came in June, this corn shot up like weeds, and was sufficiently matured to be beyond the reach of frost by the first of September, while the yield was something over seventy bushels per acre. In good seasons it has exceeded one hundred bushels per acre.

"I risk nothing to the season," said one of these men to me. "Corn must have a certain length of time to grow and mature, and I have always succeeded in getting my seed patch, as I call it, advanced sufficiently in the fore part of the season to be safe from the earliest frost in the latter part. I cultivate this patch from the time it is planted until I can no longer straddle the rows with a high cultivator. I go over it as soon after every shower as I can get on the ground with a team.

"In cultivating our corn we aim to stir the entire surface as often as possible. The shovels of the cultivators are set to run only two to three inches deep, and a team can walk along with them as easily and rapidly as with a buggy. There is no labor connected with the cultivating except the traveling. I have taken a field of twenty acres of corn that, owing to a wet spring, was planted the 12th of June, and by a constant stirring of the surface of the soil, made a crop of sixty bushels of sound corn per acre. My horses are all rapid walkers, and as soon as the plants reach a sufficient height to allow me to go ahead, I run over the field five times every two weeks until my cultivator will no longer pass over the stalks."

The corn plant is a gross feeder, and it will gather and assimilate the plant food in the soil at an astonishing rate if the surface is kept in a proper condition—that is, loose and mellow. As to how late in the season, or at what stage of growth cultivation should cease, can best be determined by the season itself. It should be borne in mind that in a dry season the roots of corn go down and run deep in search of moisture—I have traced them to a depth of twelve feet—and that as repeated stirring of the surface tends to conserve this moisture, it certainly cannot be otherwise than beneficial. In a wet season, however, the feeding roots spread out and run near the surface, and literally fill every foot of soil between the rows. To cut off or mangle these roots, must, it is very evident, prove detrimental to the growth of the plant. Where shallow and oft-repeated cultivation is practiced, it will be found that the soil,

just beneath this loosened top layer, is filled with small feeding roots, and that when cultivation ceases, and the plants shade the ground, these small roots will often ascend to within half an inch of the surface, especially if repeated showers keep the soil damp a week or two. Long experience in the growth of this crop, and close observation of its manner of rooting, has satisfied me that shallow and often repeated cultivation is most effective in inducing strong and rapid growth, and that such cultivation is beneficial until the plants completely shade the ground.

THE PROSPECT OF CATTLE RAISING FOR THE SMALL FARMER.

MARION RAMBO, IOWA.

The present tendency of all enterprise seems to be toward centralization and monopoly, driving the small producers out of business. Must this be the fate of the cattle raising business? Must the market in the future be so controlled by the large producers that the business will be wholly unprofitable to the small farmer? or are his prospects encouraging? The industry is one that can not be monopolized. Buyers may corner the markets and packers may influence the prices, but no individual or organization can regulate the production of the supply; whether it is to be produced upon the large ranch or small farm, the condition of the country must largely determine.

Heretofore Western pasturage has been very cheap, and as a consequence the markets have been glutted with stock so cheaply produced that the ordinary farmer could not successfully enter into competition. But with the rapid settlement of the West, this condition is passing out of existence. Cotemporaneous with this decrease there is an actual increase in the market demand. The population of our cities and towns, enlarging very rapidly, creates an ever-growing demand for food supplies that can only come from the farm. The fact that the increase in our urban population is out of all proportion to that of the rural is all the more encouraging to the small farmer.

An era of small farming seems likely to dawn upon the Central West. It will be in reality a golden era in farming when farms will have from forty to eighty acres, and farming will be done not extensively but intensively. This is being brought on not so much by an awakening intelligence and a knowledge of better methods among farmers, as by the increase of population and the demand for country homes which are leading to a division of our hitherto large farms and compelling the adoption of more intensive and, therefore, more intelligent methods of farming. In this, as in all other industries, "necessity is the mother of invention." It is from these small farms that the produce supplies of our country in the near future will come. The stock raised will be of the finest quality, expenses of production will be reduced to the minimum, and the profits enhanced by the growing city demands.

The small farm will reduce the farming industry to a business science. Laxness in business methods is one of the chief characteristics of the ordinary large farm. The small farm is inaugurating the employment of better methods. The farmer has a better understanding of his debit and credit accounts, as more systematic bookkeeping is followed. He is better acquainted with the best methods of culture, the cost of production, and the superior varieties. Thus are we coming to learn that it is possible to make more money on ten head of cattle, properly cared for and prepared for the market, than was formerly made on one hundred head. The outlook for the small-scale cattle grower is encouraging.

TENANT HOUSES ON FARMS.

Every large farm should have a tenant house conveniently located on the premises. Even for a smaller farm, where the owner is obliged to depend upon hired help to some extent, a tenant house will prove a good investment. It is a permanent investment, and adds that amount to the value of the property. The farm laborer living therein can get his meals at home, thus saving that much extra work for the farmer's family. Personal matters can then be discussed with more freedom than when a man, perhaps a stranger, is present, which is a consideration of no small moment, especially as men are usually but a year or two in a place. Many things are said at meal time that, if repeated outside of the family, might cause trouble. A tenant house would prevent all this. A house sixteen by thirty feet will afford all the necessary room, or a house fourteen by twenty-eight feet, two stories high, with a kitchen ten by twelve feet on the rear, will give good accommodations for a family of five or six. One bedroom will be below, and two or three above. The surroundings should be made neat and pleasant. A garden and several fruit trees will be more profitable than shade trees. If a row or two of small fruits and berries are added, two or three dollars more per year can be added to the rent, and will be willingly paid. The tenant or his family will usually give them good attention, for it is to their interest to do so. If the well water be hard, a cistern or some plan for obtaining a needed supply of rainwater should be provided. Such things cost but little and make the property more desirable, inviting a better class of men than when such accommodations are not present.

IN THE ALABAMA PINE WOODS.

JAMES K. REEVE.

The agriculture of south-western Alabama is undergoing a transition which will prove a revelation to such as have been accustomed to look upon this region only as the home of the turpentine gatherer and the piney-woods razor-back hog. Some features of life in this region are worth noting, because they are fast passing away.

A piney-woods farmer has been rather crude. He has been a small-farmer, never a planter. He has never grown a crop of cotton, and not much of anything. Upon a clearing he has had a "patch" of corn, which has furnished him bread. A plot of cane has given him a winter supply of molasses. Some upland rice has also been grown, and cleaned by the most ancient and primitive methods. Yams from the garden added to the meal. A few hogs running wild in the woods were brought down with a rifle-shot when wanted for meat. A few sheep managed to escape the dogs, and, with these, the requirements of life were mainly satisfied. Horticulture was represented almost exclusively by the Scuppernong grape.

If anything further was needed the pine woods were laid under tribute for turpentine and resin, the chief commercial products of the region. Many turpentine stills now do but little business, for the owners of the pine lands have generally prohibited boxing the trees for their sap. The razor-back still ranges as of yore, but more sheep are to be seen in the woods. One farmer has but eighty acres of land yet is the reputed owner of 5,000 sheep. These range in the woods the year through without the care of a shepherd, and rely for sustenance wholly on their own foraging capacity. Once a year they are brought up—at shearing time—the lambs marked, and are then turned loose again to run wild another year. Even under such shiftless methods the business is said to pay well.

Better methods of husbandry are being used, and there is promise for the future. One drawback to stock-keeping has been the lack of good winter forage, for, while cattle can find some pasturage for themselves through the winter, they also need feed during the three winter months. The prevailing Bermuda grass makes an excellent summer feed, but in the winter there is little to be had besides the native crab grass; and this, though good when properly cut and cured, is not of much value when left to ripen and dry in the field. Recently there have been some attempts to fill this need by growing the cultivated grasses, by sowing oats and cutting them for hay when in bloom, and by sowing German vetch in the fall.

HAY MULCH AS A FERTILIZER.

THOMAS BRABAZON, CONNECTICUT.

Wishing to use a piece of land that was apparently a most barren, worthless plot of ground, one of my neighbors tried some experiments. The only vegetation apparent was a scanty growth of daisies, a few buttercups, and a large quantity of sour grass or field sorrel. The soil was of hard clay, and in a drouth it was baked to the depth of five or six inches, and possibly more; and I have seen a heavy shower lasting several hours pour down upon it until it seemed as though it would deluge the whole surface, but to my surprise, after it had ceased raining for two hours, this ground seemed as hard and dry as it had been before.

Two years ago last summer this land was broken up, manured, and planted with potatoes, which yielded almost nothing. But it was here that my neighbor tried a new plan, at least new to me, and possibly to many others. He had a partially meadowed piece of land close by, and during the summer when the potatoes were hoed for the last time he cut the grass on the meadow, and after it had dried he spread it along through the drills between the rows of potatoes. He cut the meadow the second time and spread the cutting as before; and by the time the potatoes were ready for digging the hay had settled well down on the surface, and the hay was covered with soil when the potatoes were dug. The next spring it

was plowed much easier, appeared more friable than before, and after tilling it well, he sowed a varied assortment of vegetables, and among them peppers, which, when ready for picking, were the largest in this vicinity. Some of the vegetables did not do quite as well as they would, had they been in other soil, but taking all in all he had a surprisingly fine crop on his hay fertilizer, which he continued to apply whenever the meadow was ready for cutting.

Last summer, much to my surprise, he put several trenches through the lowest part of the clay bank, which broke up even better than before, and set out some four hundred or five hundred plants of White Plume celery, using a liberal quantity of well rotted barnyard manure. Every one knows about the drouth we experienced last summer, but he continued his application of hay, and the result was marvelous. The hay protected the scorching sun from striking directly on the soil, and all the moisture was available for the plants. To be sure there still remained lumps of earth which were exceedingly hard, but these were utilized in a telling manner. In hoeing his celery he would set these hard lumps of clay around each plant, about two inches away from the stalks, and carefully draw the looser and finer earth up to it. The result was that he had some of the finest celery I have ever seen, and it was as clean and white when taken from the ground as though it had been carefully washed and scrubbed.

THE ROTS OF STONE FRUITS.

L. R. TAFT, MICHIGAN AGRICULTURAL EXPERIMENT STATION.

Particularly in wet seasons and on low, poorly-drained soil, peaches, plums and cherries are often badly injured and sometimes entirely destroyed by what is commonly known as brown rot. The decay of the fruit is due to the development within the tissues of a minute parasitic fungus, which penetrates the cell walls, absorbs their contents, and gives access to the germs of decay. The disease cannot occur without the presence of the specific spores or seeds, which are produced in immense numbers on the surface of diseased fruits, and are carried by insects, or wafted by the wind from tree to tree, and from fruit to fruit. The presence of moisture is required for the germination of the spores, so that, although warm, muggy weather cannot be considered to be the real cause of the peach and other rots, it furnishes the conditions of moisture and temperature required for their development and rapid spread, and from this it may very properly be considered an inducing cause.

It has been noticed that, when two or more fruits are in contact, they are more likely to be attacked by rot than when located singly upon the branches, and also that, when one fruit of such a cluster is attacked, the others seldom escape. A reason for this can be seen if we examine the fruits after a rain or heavy dew, as we shall find that while the moisture quickly evaporates from the surface of isolated specimens, it remains for a considerable length of time, and perhaps continuously, upon fruits in groups, at the points where they are in contact, thus providing moisture in which the spores will readily germinate. Not only are the conditions favorable for the appearance of the fungus upon all of the fruits in the cluster, but, if one only is infected, it will quickly transmit the disease to its neighbors. Aside from any effect it may have in increasing the size and selling price of peaches and plums, it can be readily seen that the thinning of the fruit, so that none of them will be in contact with neighbors, will lessen the danger from rot.

As is the case with nearly all other fungus diseases, it has been found that the brown rot yields, although not very readily, to applications of various salts of copper. To be effectual, the tree should be sprayed once before the blossoms open, and the treatment must be kept up, with early sorts and in wet seasons, to within two or three weeks of the time the fruit is gathered. This would make the cost quite heavy, but it must be remembered that if spraying is neglected the entire crop is often lost, and, moreover, that the same applications will serve for the destruction of other fungi and of various insects, which, if not combated, might destroy the crop, and even the trees themselves. All of our stone fruits, so-called, as the peach, plum and cherry, are attacked by the curculio and gouger, and the peach is subject to the mildew and leaf-curl, while the plum and cherry have the shot-hole fungus and black knot in addition to brown rot and various spot diseases to withstand.

To effect the destruction of these pests, the following plan of operations would be desirable: 1. Spray the trees just before the first blossoms open, using Bordeaux mixture—one pound of copper sulphate, one pound of lime and twelve gallons of water—to which one ounce of Paris green could be added. This will destroy the spores of any disease that might be upon the branches and prevent them from destroying the blossoms and young leaves, as well as any chewing insects (including curculio) that might be feeding upon the trees. 2. Within one week after the blossoms have fallen, spray again, using the same preparation. 3. At the end of ten days more, make the third application. 4. If the weather be rainy, or if curculio are plentiful, spray again ten days later. As a rule, this will suffice for cherries, and for all except the early sorts of peaches, which, with plums, would need occasional treatments with ammoniacal copper carbonate, made by dissolving copper carbonate in ammonia water and diluting with water, using about three ounces of copper carbonate to forty gallons of water, with about one pound of ammonia to dissolve the carbonate. Unless the weather be rainy, this solution may injure the foliage of stone fruits.

While the treatment as above will generally suffice to hold the curculio in check so as to give a crop, particularly if the trees set a large amount of fruit, it should not be relied upon entirely without a frequent examination of the trees, and if they are still found, in spite of the spraying, in dangerous numbers, the jarring of the trees should not be neglected. In ordinary seasons, the leaf curl of the peach and the shot-hole fungus of the cherry and plum, can be almost entirely prevented, and there will be little, if any, loss from brown rot upon any of the above fruits. A season with frequent warm rains is, however, so favorable to the germination and growth of the fungus, and so unfavorable to the successful application of fungicides, that entire immunity cannot be promised, although if the spraying is properly attended to, from one-half to three-fourths of the fruit will be obtained in seasons when the crop would be entirely lost were the trees allowed to go unsprayed. Moreover, with healthy foliage, the trees will be able to make a much stronger growth on which to bear the next year's crop of fruit.

DETERIORATION OF FRUITS.

E. P. POWELL.

The question of the deterioration of fruits comes up in cycles; and it is pretty sure to be asserted by some one who fails to make a special fruit grow that it has gone into its dotage. The Spitzenberg apple and the White Doyenne or Virgalieu pear are most frequently instanced as cases of fruit decadence. But there are so many incidents that affect the life and development of trees that we must know a good deal about a fruit before we can draw the conclusion above noted. For instance, I have a new seedling apple that came up not more than about a dozen years ago; and it is so handsome, so good, and so long-keeping, that I desire very much to propagate it. But it is, in all respects, like a dotard Spitzenberg, or worse. It would be picked out, in all cases, as a decrepit, wornout variety. The truth is it is peculiarly subject to anthracnose, and the fruit is beloved by insects. To make it sound requires that the young trees be constantly cared for, washed with kerosene emulsion, and the fruit thoroughly sprayed. The Jonathan, which is a seedling of Spitzenberg, is, like its parent, a special favorite of the codlin moth, and the tree is delicate. Baldwins do best grafted high on old stock; so do Greenings. There is no reason why we cannot get good Spitzenbergs; and I do get them by exercise of great care. The price paid for them abundantly compensates extra attention and labor. The history of all our fruits shows this same story of special liabilities to fail under special conditions. Most particularly true is it that some fruits need a large amount of fertilizing material or plant food to do their best.

Keeping Hillsides in Sod.—On tillable, sidehill land there is usually a heavy loss every time the land is newly plowed, as the rain of even a moderate shower is not absorbed as fast as it falls, but by its own gravity rushes down the hillside carrying with it much of the surface soil, and, if the soil be soft, often deep gutters are formed. If such slopes were well seeded to timothy or clover, but little injury would result, and if properly managed a timothy sod may be kept in good condition on sidehill pasture land for many years. Usually the soil in such places is naturally thin, hence previous to plowing apply fertilizer in some form, preferably well rotted barnyard manure. This will keep the timothy in good health for many years. Should any portion become thin, let the whole grow to a height of six or eight inches, when either commercial fertilizers or well rotted manure can be applied to the thin portions. Thus guarded, even heavy rains will not carry much fertility away, but cause it to lodge against and become absorbed by the growing plants. Hillsides should never be pastured very closely.

A PINE STUMP.

G. A. WOOLSON, VERMONT.

In the manufacture of rustic work, nature has no peer. So perfect is her work that we rightly class it among "fine arts." In originality of design, adaptability, beauty of color, and finish, Dame Nature and Father Time have utilized the elements to advantage, and given in the present instance a structure both unique and beautiful for holding potted plants. I say beautiful; but only so, perhaps, in the eyes of those in tune with nature. For many, alas! are "walking through wonderland with their eyes shut." Forsooth the man who advised painting this grand old stump red before doing anything with it may save his paint and politics for the town. The delicate tracery of pale green moss over the soft gray of its polished antlers is not to be hidden by war paint, or aught save "green things growing." Comparatively few of the many pots used needed to be wired in place; now and then a single nail rendered one immovable, but the majority of them fitted into the outstretched arms and fingers, which held them with a grasp which summer storms failed to loosen. In preparing the ground about the stump, its outline was carefully followed, with no extension save a slight oval at the front and rear. Ferns have precedence only at the curving sides. *Osmunda regalis*, various species of *Aspidium*, and *Cystopteris bulbifera* fill out the space on either side, carpet the ground, and line the sward behind them. A few harebells add a needed bit of color.

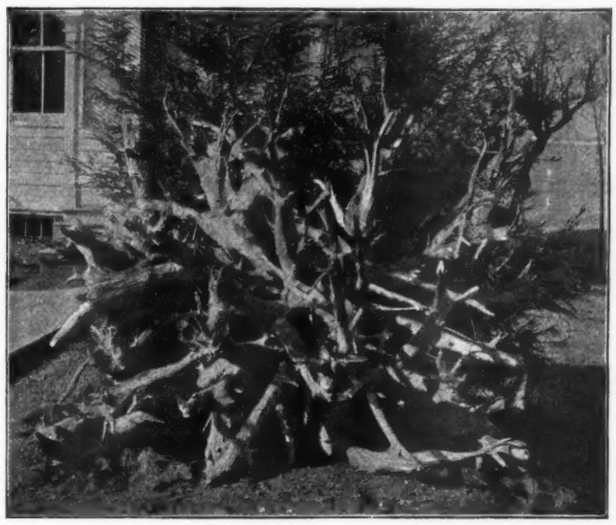


FIG. 1. THE PINE STUMP IN WINTER.

This much of nature's own. Two years' experience in massing plants on this wonderful stand enforces the principle of balance and beauty of line; hence the necessity of placing sub-tropical plants in large pots a little above the central line, that a counterpoise of large and striking leaves may relieve the rich mass of cannas and caladiums growing at the base of the stump. No "top-heaviness" results from this arrangement, for plants of the same class attain so much greater size growing in the ground that good proportion is preserved, while character lines are well drawn. The first season a miscellaneous assortment of plants composed this pile of living beauty, with the pleasing result shown in the illustration. The second year the shadier side of the front was devoted mostly to begonias. The skillful adjustment of some eight or ten varieties of these plants produced a mosaic effect of luxuriant beauty. On the more exposed side, a few sober leaved and minded plants prevented too much gayety among the colored tribe, which held high carnival in the afternoon sun.

In a work of this kind it must be borne in mind that principles of art applicable to color may, to a certain extent, be worked out in this line. A dash of color here and there should emphasize rather than break harmonious tints; foliage plants are better for this purpose than flowering sorts. Silver-leaved geraniums, green and white coleus, or other plants of light foliage not dependent on the sun for color, serve admirably to lighten shadows. Variety in shape of leaf is another point for consideration. Large, plain leaves should neighbor freely with finely cut patterns, to avoid heaviness in effect. The rear side of houses and characters will not always bear close inspection; but this is not the case with the pine stump in question. Last summer's visitors who were inclined to enthuse over the front were invited to the rear of the stump before their supply of adjectives ran low; for in point of color the back arangement was particularly fine. A bright yellow coleus was framed into the central groin by rich, glossy green, backed by a red plant, which shaded off above the arch of vines into the deeper tones of a ricinus, with a suggestion of green farther on. At the foot, Zonale geraniums on either side, with Cloth-of-Gold in front, had their scarlet buds nipped in favor of a more luxuriant sort, with plain green leaves and great trusses of exquisite salmon-pink flowers: a blue morning-glory, a nasturtium or two, with a silvery centaurea, complete a poem in color written on gray. "Beauty of line" will take care of itself if we but follow natural outlines, which was done in this case with neutral-tinted cord and double-pointed tacks, that the graceful drapery of vines might enhance rather than hide natural curves. Vines, in truth, are nature's drapery; without them no picture is complete. *Cobœa scandens* was used successfully the first year, but when called for the second was out of the

FIG. 2. FRONT VIEW OF PINE STUMP IN SUMMER.

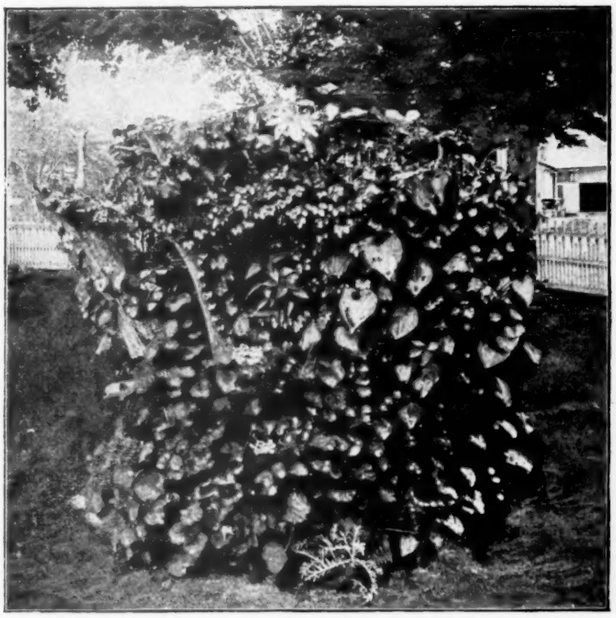


FIG. 3. REAR VIEW OF PINE STUMP IN SUMMER.

market. *Pilogyne suavis*—a vine less formidable than its name—proved an ideal plant for the subject in hand.

Jack Frost reduces many things to first principles. Again, we had "nature unadorned," which phase of "stumpology" is most interesting to the mineralogist, who finds a variety of stones held aloft, or tucked away in the midst of the sound old roots. However, long seams and the rotting trunk at the back are best hidden through the winter months by shapely hemlocks. Sharpened, firmly wedged in place, and occasionally crowned with powdery masses of snow, these trees were, in themselves, a pleasing feature, but doubly so contrasting with silvery gray; likewise the pine boughs at the sides, which protected the fern roots. [Our photographic engraving, Fig. 1, Page 317, presents a view of the unadorned stump, as it appears in winter. In Fig. 2 is shown a front view, and in Fig. 3 a rear view of this stump in its summer dress.]

CULTIVATED HONEY PRODUCERS.

B. BUTLER.

The plants which yield a generous supply of honey are not numerous, and many of them are not of a character which invites cultivation. The most important of these cultivated plants, and the one upon which beekeepers place the most dependence, is the white clover. While it is not so free a grower as red clover, and is, therefore, less cultivated by the farmer, it still makes excellent pasturage, forms a thick mat near the ground, and is, by no means, an unprofitable forage plant. It grows spontaneously in many by-places, even when it is not cultivated. It produces an abundant flow of honey during its blossoming period, June and July, and the honey is peculiarly white, fine, and free from any disagreeable odor or offensive taste. The farmer who keeps bees can well afford to raise white clover. It makes a pretty lawn when closely shaven, and is frequently used for this purpose about city residences and village homes. Another important and cultivated honey plant is the buckwheat. It comes late in the season, beginning to blossom in August and remaining in bloom until the coming of frost. From this plant the bees gather an abundant harvest of very rich, dark honey, having a peculiar taste, not at all offensive, and for which a liking is easily and speedily acquired. But buckwheat is not largely cultivated. The grain does not always fill well, and the crop is not always a very profitable one. The rapid growth of the plant, however, makes it useful as an eradicator of weeds, and enables it to put the soil in a good condition for subsequent cultivation. It will grow on almost any soil, though usually the better the soil the better the buckwheat.

It is believed by some apiarists that in alsike clover will be found a plant that is alike profitable for the apiarist and the farmer. Whether the hopes entertained of this forage plant will be fully realized, is a matter for future demonstration. Prof. Cook says of this plant, "Alsike, or Swedish clover, seems to resemble both the red and the white clover. It is a stronger grower than the white, and has a whitish blossom tinged with pink. This forms excellent pasture and hay for cattle, sheep, etc., and may well be sown by the apiarist. It will often pay apiarists to furnish neighbor farmers with seed as an inducement to grow this superior honey plant. Like white clover, it blooms all through June into July. It should be sown early in the spring with timothy, five or six pounds to the acre, in the same manner that clover is sown."

To this list of cultivated honey producers can be added the red raspberry, though it is the wild berry, growing spontaneously on mountain clearings and in open fields, which produces the largest amount. The red raspberry is an abundant producer, and the honey from it is nearly or quite equal to that produced from the white clover. And as this berry is one of the most delicious of small fruits, there seems to be good reason why it should be cultivated, especially by those who have convenient and ready access to a good market. The blackberry, also, often cultivated, but oftener growing wild, produces honey, and the reasons which would lead to the cultivation of the raspberry ought to be efficacious in its care. It is vigorous, very productive, and of good, marketable qualities.

GATHERING BUTTER.

S. BARRINGTON.

Oftentimes both the farmer's wife and professional dairymen experience considerable trouble in gathering the butter into a solid mass, even after it appears in the churn in small granules and floats about in the buttermilk. The usual plan is to manipulate with the dash until the butter can be removed from the churn in a more or less compact form. Thus treated, it too often presents a greasy appearance, and by the time the usual washing and the proper quantity of salt is well worked in, the granules are mostly broken, and the result is that the output is marketed at a low price. Very much of this trouble can be avoided by a simple process, easily understood, and within the reach of all. As soon as the butter appears and the process of gathering is about to take place, then, for an eight pound churning, pour gradually over the floating butter in the churn two gallons of cold water, in which a teacup of fine salt has just been dissolved. Let it stand for a moment, then manipulate with the dash as in the usual manner in completing the churning, and the chances are the butter will be well gathered but in unbroken granules. The reason is that the water containing the salt increases the density or specific gravity of the buttermilk, causing the granules to rise to the surface. It also hardens them, removing a certain substance or coating from their surface, allowing them to readily unite under pressure such as is obtained by the use of the dash or revolving churn. Butter gathered by this process is much firmer, better granulated, and consequently better flavored. The only objection to be offered is the addition of salt to the buttermilk; but for feeding purposes, if added to the swill or house slops, no ill effects to the swine are ever observed. When fed to hogs at clover pasture, the action of salt removes all danger from bloat by simply increasing their desire for drink.

THE GENERAL PURPOSE COW.

EDWIN MONTGOMERY, MISSISSIPPI.

Beef production and milk production in the same animal are often useful to the farmer, but should not be the aim of him who desires to receive the greatest amount of profit from the dairy. A first-class beef and milk and butter cow, combined in the one animal, is rarely, if ever seen; either the beef tendency will prevail, or the dairy qualities. All animals require so much food for support, and the balance that they are able to digest goes to keep up heat in the body and to the production of fat. This fat will not be evenly distributed,—half in the animal frame and half in the milk-pail. If the animal has been bred long in the line of beef production rather than milk and butter, the greatest amount of this fat will go to beef, and the reverse. The first-class dairy cow cannot be made very fat while in good flow of milk. She cannot digest enough rich food above the amount required to maintain support to deposit a large amount of fat on her bones and maintain a heavy flow of milk at the same time. The general purpose cow, then, is not a strict reality, though there may be good milking strains of beef breeds, which are useful where beef is the main object.

DAIRY PITH.

GEORGE E. NEWELL.

A permanent pasture should signify permanency of good feed.

Take good care of the young cows, that they may continue profitable when they are old.

Lead a cow rather than drive her. Gentleness should be the watchword to the dairy stable.

The whey following a good cheesemaker's work is poor feed for pigs, as it contains but little casein, or butter fat.

The dairyman with a good well and a windmill can feel about as independent as the one who has running water on his farm.

When you strip a cow's teats to the last drop in milking, do it not so much for the immediate gain as to keep the udder of prolific habit in the future.

The merciful dairyman when he draws calves to market puts them in a comfortable crate, instead of tying their legs and doubling them under the wagon seat.

To make the cow truly profitable, you must maintain her milk yield along natural lines of feeding. Indulgence in freaks of food stimulation does cows more harm than good.

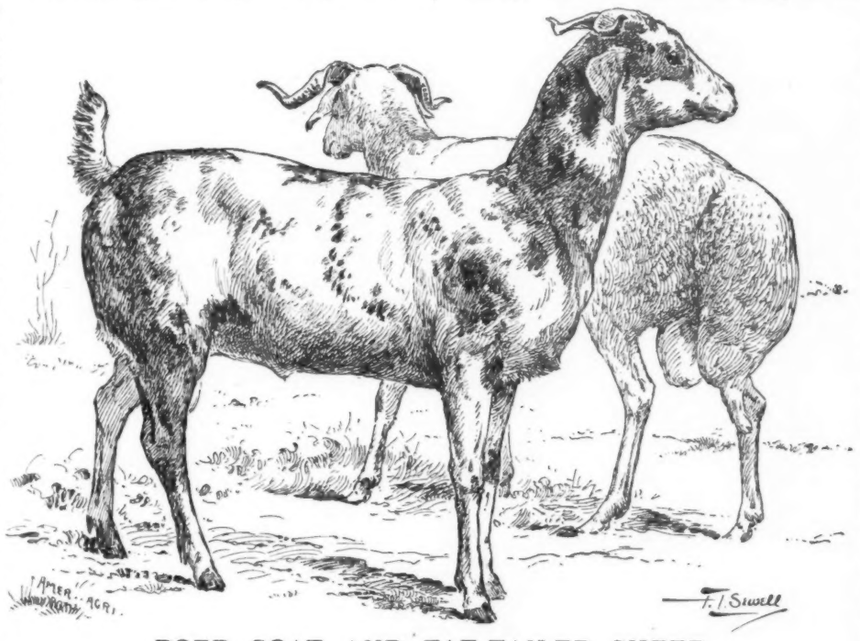
While dairy animals need shade in summer as much as shelter in winter, it should not be so extensive in the pasture as to interfere with the natural development of nutritious grass.

The wise dairyman who does not turn his cows out to pasture in the spring till it is of sufficient growth to support them, gets quality in the feed, which is of as much importance as quantity.

The cow that must graze industriously half of the summer to recover physically what she has lost by indifferent keeping through the winter, is not apt to earn a dollar in real profit for her owner.

SHEEP AND GOATS FROM AFRICA.

Among the interesting objects in the South African exhibit at the World's Fair in Chicago were a Boer goat and a fat-tailed sheep, both of which are represented in the accompanying illustration. The former belongs to one of the largest and stateliest breeds of domesticated goats. Its hairy coat, as smooth and close as that of a well-groomed horse, is white, with irregular spots of rufous brown. The ears are pendant, the horns small and fine, turned outward and upward. The Boer goat is a native of South Africa, where it has been tamed and domesticated by the Boers, who are descendants of the original Dutch colonists. Its great size, strength and spirit fit it admirably for harnessing to children's carriages, and as a leader to a flock of sheep. In the latter capacity it will march with stately step at the head of its wooly regiment, which follows with such implicit confidence that there is far less disposition to straggle and graze beside the way than in an unattended flock. Such leadership is peculiarly valuable in the widespread veldt, where predatory flocks of wild dogs and jackals lurk, especially as the Boer goat is ready to stand its ground and protect its charge. Whether these large, strong, spirited goats could be profitably raised in the United States, for their milk, flesh and skins is problematical. Goats of any kind have never been as popular in this country as in many other parts of the world, though there are countless acres of shrubby upland lying waste, upon which goats could find subsistence. The African fat-tailed sheep represents a type of sheep which has existed from a remote antiquity. The enormous fat tail, which constitutes the distinguishing characteristic of this class, is common not only to the indigenous breeds of Africa, but also those of Western Asia. This appendage is supposed to have been referred to in the Mosaic law as recorded in Leviticus, third chapter and ninth verse, where it is commanded that in the sacrifice of a lamb, "The fat thereof and the whole rump, it shall he take off hard by the backbone." There are distinctive differences between the various African and the Asiatic breeds of these fat-tailed sheep. Of the African, a ram imported from Tunis was presented to George Washington and kept by him on his Mount Vernon estate, where it was used for crossing on native ewes. Long before that they were carried by Dutch trading ships from the African coast to Holland, where crosses between them and the native sheep produced the Texel breed.



BOER GOAT AND FAT-TAILED SHEEP.

The singular appendage which marks this class of sheep consists largely of fat. It is, in fact, a provision of nature, like the camel's hump, to supply a reserve from which the animal derives the power of sustaining life when food becomes scarce. During a period of more or less privation of subsistence the tail is slowly absorbed, and after severe and prolonged starvation it shrinks to a mere skin. The tail is one of the most highly prized portions of the dressed mutton carcass, and in cookery supplies the place which lard takes among those who use hog products.

Blanketing Sheep.—It was an old custom with early breeders of Merino sheep in Italy and elsewhere to cover the lambs with a sort of linen shirt, sewed on, so as to keep a constant pressure on the wool, and wetting this covering with warm water to make the wool soft and sleek. As the lamb grew the bandage was loosened slightly, but kept tight enough to hold the fibers together. The lamb was killed when its pelt reached the highest value for the desired purpose. It was, and is, a practice of some sheep raisers to keep coverings on their sheep to give greater quality to the fleece. The practice is quite common with exhibitors at sheep shows. At the Columbian World's Fair, Mr. H. G. McDowell showed in his large exhibit what he was pleased to call his "light topped" Dickinson delaine merinoes. They had evidently been blanketed since they were shorn last spring. The effect was very pleasing. The expense was trifling, and the selling qualities of the fleeces were greatly enhanced.

DIVERSIFIED TYPES OF MERINO SHEEP.

R. M. BELL, ILLINOIS.

One of the lessons at the World's Fair, at Chicago, was the fact that Merino sheep are divided into many distinct types, branches, or families in this country. It is well known that one hundred years ago there were numerous and very distinct types of this famous breed of sheep in Spain. They were given names significant of their habits, region of country they occupied, or the name or official position of their owners. The Merino breed of sheep, wherever found, traces its origin to Spain. It is safe to suppose that sheep of the various types were secured by importers, and that each would transmit its original characteristics to some extent; but in no wise could this account for the variations we have in this country. Nor is it known that any of the old Spanish types are found unchanged in any of the countries whither they were carried. One hundred and twenty-five years ago Spanish sheep were introduced into Germany, and the farmers of Saxony bred them to fineness of wool as no one had done previously. A few years later the French, anxious to avoid paying tribute to Spain, secured by royal grant some of the Merino sheep. The most notable experiments with these sheep were conducted under the orders of the king, at his Rambouillet farm, twenty miles from Paris. They were bred to a standard suited first to French agriculture, second to the production of the highest quality of mutton, and third to the peculiar wants of the woolen manufacturers. A few years later the king of England, following the course of other European sovereigns, by special permit of the king of Spain, secured some Merinos. They gained some ardent friends, and for a time promised to become popular, but soon lost favor. They are still bred in England, though scarcely known. The few there now are of the best type of a mutton Merino, and are distinctly English.

The Merinos were introduced into the United States during the first decade of this century. It seems curious that the old breeders had no standard save in blood lines, which they guarded with sacred vigilance. This standard was respected and conformed to by breeders very generally. There was a sort of ostracism for any breeder who disregarded blood lines. The result of all this was good for the fine wool industry, and might have remained so forever if there had been no progress in agriculture, no severe foreign competition in wool growing, no demand for better animal food than hog meat and cheap beef. The changes came, and mutton was the means of timely relief from the depression in the sheep busineess. The Merino sheep was long the national wool-bearing sheep of the country, but it was without pronounced claims to meat production. There were prejudices against Merino mutton; it was said to smell and taste badly, and was less desirable than goat's meat. This false idea had to be rooted out. It was a matter of education, and took

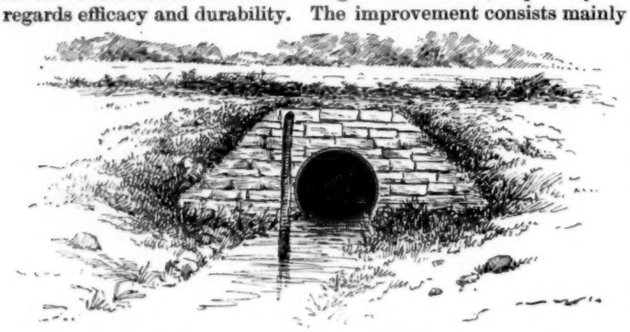
time to produce Merino mutton which the people could not distinguish from Southdown. Had there been systematic work in this, it would have been quickly done; but the old Merino breeders opposed breeding toward mutton qualities, and the breeders of British breeds of sheep ridiculed the idea. For a time it looked as though the Merinos were to be supplanted on the very soil where they had attained almost universal recognition.

The old breeders could see an advantage for flock owners in using a Merino cross on any sort of a sheep, but were bitterly opposed to crossing an English breed on the Merino. This ruling could not dispel the influences of pasturage in changing types of Merino sheep, however well established and fully endorsed by Registry societies. The Vermont sheep became modified when taken to the luxuriant pastures of the West. They grew larger and more robust, with fleeces equally improved. They were no longer Vermont Merinos, save in blood lines, though they were a result of the fertile and abundant pasturage of the West. This diversifying of types is of course unavoidable, and will increase more rapidly now that Vermont rams are not used to conform Western flocks to an Eastern standard. In addition to this, the more liberal food supplies, the result of improved farming now more common, will still further develop and extend the variations already noticed.

MODERN BRIDGES AND SLUICES.

L. D. SNOOK, NEW YORK.

During the past ten years there has been a great improvement in the construction of small bridges and sluices, especially as regards efficacy and durability. The improvement consists mainly



SEWER PIPE BRIDGE WITH MASONRY EMBANKMENT.

in the use of vitrified sewer pipe, which, if properly placed in position, will be found in good condition after many years, while the common wooden and stone sluices, as usually constructed, need more or less attention after a time.

Where the old wooden or stone sluice is one foot square, a sewer pipe ten inches inside diameter will remove the water equally as well, as there is comparatively no friction and no impediment or stoppage as by the old process, as the water glides noiselessly through on the smooth, glazed surface. The chief points to be observed in the use of these pipes is to have the upper surface of the pipe at least one foot below the surface of the roadway, and that the discharge or outlet end be at least four inches lower than

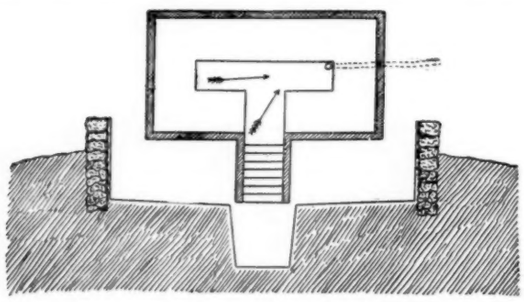


FIG. 1. PLAN AND SECTION OF CELLAR WITH EARTH SHELF.

the upper or inlet. Also that when discharged the water flows off freely, and does not back up into the pipe. Danger from the latter need only be feared during winter.

It is not an uncommon thing to see sluices and bridges of pipe where the water has formed a channel alongside the pipe, and the earth has caved in from the road surface. This of course shows faulty construction, stones and pieces of the old sluices having been placed in contact with the outer surface of pipe, and during high water none of it finds its way along the interstices thus formed, and soon enough soil is removed to cause trouble. Hence never place stone or wood in such positions, but fill in with earth firmly rammed.

For bridges, or where the pipe is over a foot in diameter, the bank upon the inlet side should be laid up with stone or brick, using water lime or cement for the purpose, as shown in the illustration. Where the filling above the pipe is from four to ten feet, this wall

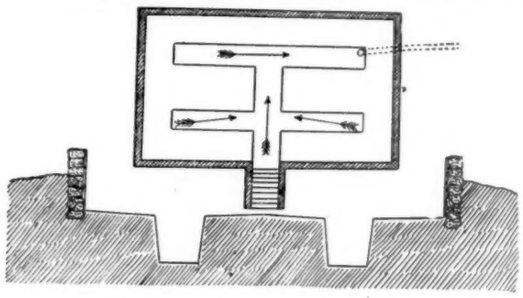


FIG. 2. CELLAR EXCAVATIONS WITH DOUBLE ALLEYWAY.

will generally be found cheaper than purchasing three or four extra lengths of pipe, and hauling the earth necessary for a sloping bank. A stake driven firmly in the channel of a stream, about two feet from the inlet, will catch all flood-wood and debris, and prevent the clogging of the pipe. This is seemingly a small matter, but it is a very important one.

A NEW PLAN FOR DIGGING A CELLAR.

S. P. SHULL, OHIO.

The size and shape of one or more apartments of the dwelling usually determine the size and shape of the cellar beneath. In consequence of this, the storing capacity of a cellar constructed after the common plan of excavating the entire area to a depth of five or six feet, is often far beyond the requirements of ordinary use. This is especially true of city lots and small country estates, where a cellar is needed more for the protection of small quantities of provisions against extremes of heat and cold than as a storeroom for large quantities of perishable farm produce held for market.

To secure the same benefit at a less cost than by the usual plan, a neighbor, some years ago, excavated the whole area to a depth of only two or three feet, digging a wide trench through the center, and leaving the soil on either side in the form of a broad shelf, as seen in the section below the ground plan in Fig. 1. A heavy coat of cement was laid on these shelves, and also on the sides and bottom of the trench. The subsoil here was clay, and the cement was laid directly upon it. It has stood the test of years, and remains without a break. By this method nearly one-half the excavation is saved, and the cost of the stone wall around it is reduced to little more than half. Where stone must be hauled a considerable distance, this alone is a great saving in time and money. Against this economy is to be charged only so much cement and sand as will cover the entire floor of the cellar and the cost of putting it on. To do this properly requires some skill, but not beyond the reach of the ordinary workman who is willing to be careful. One part good cement and two parts clean sand, by measure, with just enough water that, when the whole is thoroughly mixed together, it will neither "stand" nor sink to a level when put into a vessel, makes an excellent and durable cement for this purpose. Only a small quantity—about half a bushel—should be made up at a time, and this must be laid on immediately, using a plasterer's trowel, and smoothing down as rapidly as possible. In gravelly, or otherwise loose and porous subsoils, the sides of the trench may be faced with a single layer of brick, and the cement laid on this. Keep the brick saturated with water when applying the cement.

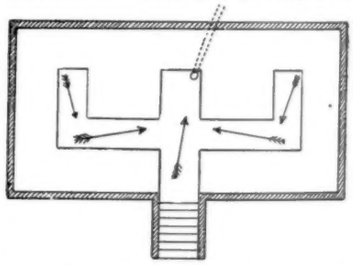


FIG. 3. ANOTHER PLAN OF CELLAR EXCAVATION.

Plans adapted to cellars of greater widths are given in Figs. 2 and 3, as illustrations of this method of construction. Modifications of these, made necessary by a different position of the outside

entrance, as well as the introduction of a stairway leading to the rooms above, will suggest themselves to the builder, and the plan may be varied accordingly. The shelves may be given a gentle slope toward the trench, and, that the water used in scrubbing and washing out the cellar may be removed through a drain, the bottom of the trench should carry it to one place, as indicated by the direction of the arrows in the diagrams. But the greatest advantage of this form of cellar over the ordinary form is found in its use. There is no back-bending necessary. Everything is placed on the shelves at a convenient height. Vegetables are confined in shallow bins, that may be removed when no longer needed. Barrels of molasses and vinegar are put up here also, within easy reach. And there is no form of cellar more easily kept clean, as it may be scrubbed and whitewashed with comparatively little labor.

SELF-LOCKING CATTLE FASTENER.

Where the old-fashioned cattle stanchions are still in use, it will be found convenient to make use of some such arrangement as is presented in our illustration, Fig. 1. Such a device is both a

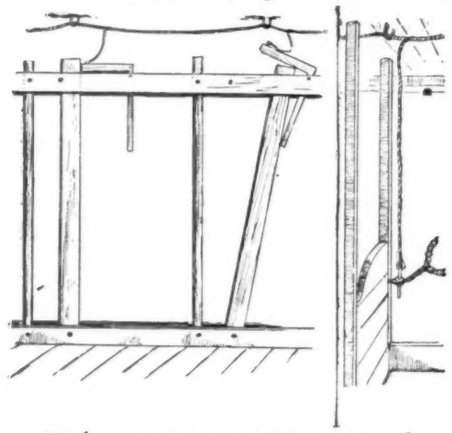


FIG 1. SECURE STANCHIONS. FIG. 2.

convenience and a safeguard against the danger of an animal getting loose and injuring others, as very often happens where a pin is used as a fastening. If a cord is connected with every stanchion in a row in the manner shown in the sketch, every animal in the row may be set free in an instant should a fire make such a thing desirable. Fig. 2 shows the same device for instantly freeing a whole row of cattle fastened with the more humane chain fastening. The illustration is given as it is to show the principle on which the device works; but in practice the cord and iron pin should be covered, or "boxed in," so that the pin might not be pulled out by an animal getting its horns fastened about the cord.

BURYING BOULDERS.

Where there are but few boulders and these not more than three or four feet in diameter, the quickest way to dispose of them is by burying them. To render this operation safe, the plan shown in the sketch may be adopted. First determine the underground

AN EASY WAY OF DISPOSING OF BOULDERS.

dimensions of the stone by forcing a crowbar down close to it, upon all sides. Frequently there is a projection at one side: this should be ascertained. Then excavate a trench, for a heavy stick or fence post, two feet longer than the stone is wide. With the supporting timber in place a proper excavation may be made and the stone undermined to half its width at least. There will be no danger of its falling as long as the ends of the stick are firmly embedded in the banks as they should be. When the hole is of the proper depth to sink the boulder below the plow line the stick is removed by prying up one end. Often even then the stone will not move unless pressure is applied at the other side. This manner of disposing of boulders is often cheaper than by blasting. In the case of extra large ones a blast may be applied to break them in two or three pieces, and these buried in holes upon the sides toward which they lean. In every neighborhood there are usually men who will take the contract to bury a certain number of boulders for a specified amount, and that is a very good way to have the work performed, unless you do it yourself or have men in your employ attend to it at leisure times.

TAMING THE HEAD OF THE HERD.

ALEX. WALLACE, NEW YORK.

Much has been said and written about viciousness in bulls, which, to a more or less degree, will hold good; but a great deal of this peculiarly bad trait in their characters could be eliminated, were the proper means resorted to. The bull is a gregarious animal; he likes not to be alone, and one of the greatest stimulants to engender a cranky, vicious nature in him is to keep him secluded, to isolate him from his world, so that he sees none of his kind and hears only the voice of his attendant. My own experience in the treatment of a two-year-old bull, with seven-eighths Jersey blood in him, and the results obtained therefrom, may be interesting as demonstrating some of the more docile traits in the animal's nature.

During the winter months I kept the bull in a stable where the young stock were wintered, feeding him on the same rations as the latter received, and driving him out to water along with his companions. He was always tractable, never fractious, and showed no disposition to separate himself from them. As soon as the cows were let out to pasture he was allowed to go with them wherever they went, except into the yard where they were milked. At the end of three months, I installed him in one of the corners of the cow stable, where he was kept until it was time to bring the herd inside, when he was removed to another stable by himself. During the period of his incarceration in the cow stable, he was well looked after, kept scrupulously clean by being supplied daily with bedding material, fed and watered regularly. Here he was as "gentle as a lamb." When leading the bull to and from water, I have at times done so by simply taking hold of his horn, and at no time did I employ any means other than the device shown in the accompanying illustration, which obviates the use of a halter, being more speedily adjusted and just as secure. It consists of a piece of rope with a loop at one end, which is thrown over one horn, a half hitch being made around the other horn, thus firmly securing the rope, for the more the animal pulls the tighter the rope is drawn. This same device was used in tying him in the cow stable, when the cows were outside, thus allowing him the freedom of walking around to the "end of his tether," he, of course, being fastened in the stanchions while the cows were being milked. The statement has been advanced that the bull should never be petted, as that course has a tendency to lessen his virility. Be that as it may, this Jersey was petted and apparently liked to be so, and no trouble was ever experienced in the lines indicated. I had a herd of thirty cows and his offspring in each case was always healthy and strong, and never did his efforts prove abortive. He knew his name, answering to it whenever called, and he would come to eat salt, a potato, or a little silage out of my hand. It may be that this Jersey was an exception to the average bull, but I think the care and kind treatmeut he received was what made him so gentle and docile.

A PET JERSEY BULL.

USES OF THE SMOOTHING HARROW.

ALBERT LEE.

In the olden days the chief work of the harrow was the preparation of the seedbed, and it was laid aside when planting was done. Then the weak sprout was left to crowd its way through packed or crusted soil, and when at length it reached the surface it was destined to find a mass of weeds already in possession of the land. During all of those years spent in deploring such condition as irremediable the needed implement lay on the premises unused. Now the harrow follows the planting, weeds are not allowed to get a start, and the soil is kept mellow all the time. Under these conditions the young plant has no difficulty in reaching daylight, and it has the field to itself when it gets up. The value of the work in preventing too rapid evaporation of moisture is no small item in the account. After the crop is up, the harrow is the very implement with which to do the early cultivating, which it does rapidly and well. Here is where this tool is not used half as much as it might be with profit. Those who do not have success in this work, may trace their failure to neglect or lack of care in execution.

The teeth of the harrow for best work must be small, slender and sharp, and should have a backward slant of from forty to fifty degrees. Good work can not be expected where the surface of the field is covered with coarse rubbish. Here is a matter of forethought that should receive attention in the preparation of the soil. Anything that clogs the teeth is likely to tear up the plants. If the soil is mellow and free from obstructions the teeth glide through the hill, doing the best kind of work without injury to the plants. Even in the garden I often run a light harrow over the ground when the peas, beans, beets, etc., are nearly ready to break through the soil. It helps the plants, and saves a great deal of hand work in its wholesale destruction of weeds. Here it is necessary to slant the teeth so as to do very shallow work; and I try to drive so that the horses may not step on the rows. The lever attachment with which the slant of teeth is so readily changed to any desired angle, was a great improvement on the rigid old-style harrow.

VALUE OF STRAW ON THE FARM.

E. R. FLINT, MICHIGAN.

Straw is worth more to any farmer to use at home than it is to sell. The cost of baling is one dollar and a half per ton, besides boarding the four men and two teams of the pressers. Add to this one dollar per ton for hauling to market, and the amount reaches close to three dollars per ton. Good bright wheat or oat straw sells at from three to four dollars a ton, seldom reaching the latter figure. Where the profit comes in is not clear, yet there are large numbers of farmers who sell all the straw they can possibly spare every year, actually depriving their stock of bedding to do so. Straw is not of great manurial value in itself, yet furnished freely to stock in the form of bedding, or where they can tread it into the litter of a barnyard, it adds greatly to the value of the manure by absorbing the liquids and holding the gases, to say nothing of the added comfort to man and beast obliged to travel over it. It is always a mark of an intelligent farmer to see well littered stables and a barnyard dry enough to be comfortable under foot. Can anything more uncomfortable for any animal be imagined than to be forced to occupy a stable where there is a week's accumulation of filth, unrelieved by the thick coating of straw which would, at least, make its bed dry, if not clean? Yet that is exactly the state of many a stable, and that too, perhaps, with a straw stack within a rod of it. I wish it were possible to impress upon the mind of every farmer the desirability of providing all his stock with a good thick bed of dry straw. No one should be guilty of robbing his animals of that comfort for the few paltry dollars the straw brings.

But there is another point. On heavy soil nothing surpasses straw to lighten and loosen it. Spread the straw and plow it under, and if it does not plow under, scatter it in the furrow for the next furrow slice to cover. If this plan is followed it will not be many years before a change may be observed in the character of the soil; it will be more friable, as well as more fertile. It is a bad practice to burn the straw. The ashes may have some manurial value, but not much in proportion to the whole straw. The valuable nitrogen has been wafted away by the flames. It may be that on some farms the quantity of straw is so great that there is no other way of disposing of it, but burning is certainly the least desirable way of doing so. Give the cattle, horses or sheep access to a stack of straw through the winter, and there will not be much of it left in the spring. Oat and barley straw make good feed for stock, given in connection with grain. When hay is high-priced, it would be wise to utilize a portion of the straw in this way.

Another profitable use for straw, in many instances, is in keeping out the cold from the stables. If there is a place where the wind whistles through or the snow sifts, nail boards to the inside of the studding, beginning at the bottom, and fill the space between that and the outside with straw. It is excellent for this purpose, and will soon pay for the expenditure in the improved condition of the stock. This is especially true of cows in milk. Nothing more quickly shrinks the flow of milk than cold.

In finding methods to dispose of surplus straw, do not forget the hog pen. No animal more enjoys a good dry bed than a hog, and there is no more perfect picture of content than a number of hogs comfortably nestled in a pile of straw. There is no reason why a hog should be regarded as partial to filth. If he could talk he would express himself in favor of clean food and dry quarters. True, he seeks relief from heat and flies in a mud hole when he can find no clean water, but if he had access to the straw stack he would show his appreciation of it. Feed the straw, work it into the manure pile, tread it under foot in the barnyard, plow it under ground, dispose of it as a mulch around trees, berry bushes or grape vines, but never sell straw off the farm. It is needed at home, and should be used there in some way.

PRACTICAL HINTS ON FEEDING FOWLS.

F. M. CLEMANS, JR., OHIO.

Proper feeding is the most important subject connected with poultry keeping, and to a lack of knowledge of it many failures may be attributed. To feed for good results one must, of course, consider the characteristics of the breed he keeps. Brahmas, Cochins, and other Asiatic breeds, easily become over-fat, and in a state of obesity will produce few eggs, and these often unfertile. The medium-sized breeds are less liable to this trouble, and the Leghorns and other active breeds are almost free from it. A quart of solid feed to a dozen average fowls is considered about a proper feed. Feed but little corn to Asiatics, as they will surely become too fat with a liberal supply of it.

After the maturing of the garden truck, and after it has been gathered, is a good time to turn the garden patch into a run for fowls. The fowls will destroy innumerable worms and insects injurious to vegetation, especially if the ground be first plowed to bring all the insects to view. Then the birds will delight in the remains of vegetables left on the ground and in the corners of the garden. A "garden patch" should have a good chicken-proof fence to exclude the fowls when their presence would be injurious and to confine them to the run after the above plan, at least for a time.

When the fowls have full range of the farm, and can pick up green food at will, it is not necessary to cultivate green food for them except in the shape of root crops or silage for winter use, but when the flock is necessarily confined, it is desirable to raise a variety of green food in the garden. Tender young green oats, rye, lettuce and clover, which may be cultivated in odd corners and spots in the garden, will make capital food and increase the supply of eggs from the confined flock very much, besides adding to the health, and adding gloss to the plumage. If this be supplemented with a good supply of animal food in the shape of green cut bone or meat scrap, a flock of hens, even in confinement, will be found the most profitable of the farm stock, considering the money invested. Turnips are a cheap crop, and an abundant supply of them should be stored in the fall. Fowls will eat them, top and all, in the winter when the more tender green food is gone. A small piece of good ground will produce a great crop of them at almost no expense.

Uses of Barbed Wire Fence.—Barbed wire fence is steadily gaining favor on its merits of strength durability, effectiveness, and low cost. The galvanized wire lasts many years, and only half as many posts need be used as with other kinds of fences. When the ground is so wet that other farm work cannot be done, is a proper time to build barbed wire fences. At such time the ground is generally moist, and soft enough to admit of driving the sharpened posts from the wagon, thus avoiding the expensive labor of digging and filling holes. To fence securely against sheep, five smooth wires and one top barbed wire are needed. Six barbed wires make a good hog fence, but will not prove absolutely reliable as regards very small pigs. For cattle and horses, three barbed wires answer fairly well, but it will be more satisfactory if four strands are used.

THE SULTAN BREED OF FOWLS.

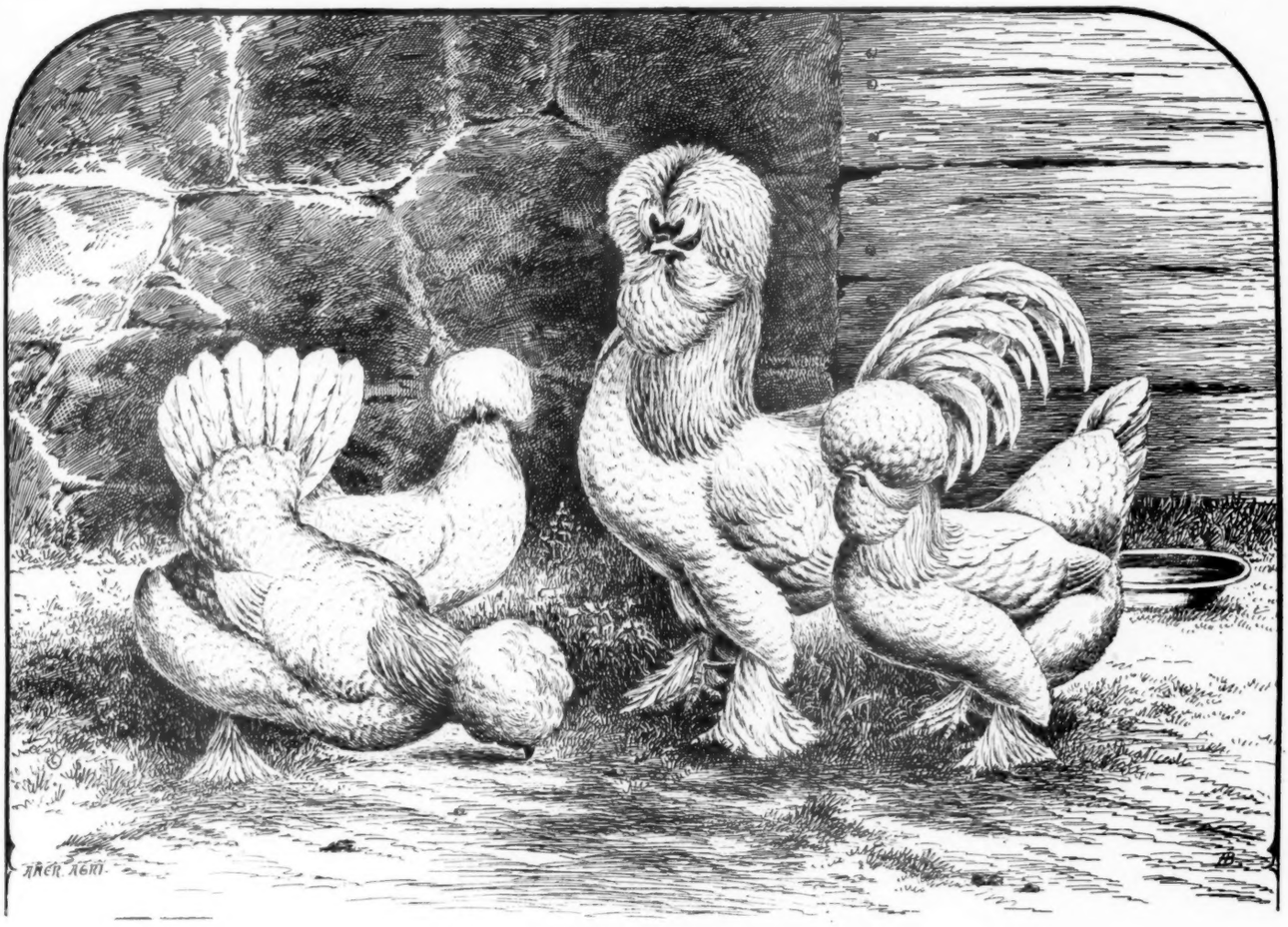
H. S. BABCOCK.

Among the recognized varieties of poultry in the American Standard of Perfection is one that is exceedingly rare, though very interesting in appearance. A few appear occasionally at English exhibitions, but Sultans do not grace the exhibitions held in this country. It is doubtful if there are any in the United States, although it is possible that there have been some recent importations, as the facilities for the introduction of fowls from abroad have so improved in recent years that one can secure them from England or France almost as easily and safely as he can from different States in the Union.

The Sultan is a smallish fowl, about the size of the Polish, and, like the latter, has a large crest. In general figure and conformation it bears quite a close resemblance to the Polish fowl, but it differs from the Polish in having five toes upon each foot, and in having the blue shanks and toes heavily feathered. It has been called, for this last reason, the "Feather-footed Polish." It has a full beard, which is full about the throat and covers the face, reaching up to the crest and concealing the earlobes. The plumage throughout is snowy white. It does not require a very strong imagination to picture this fowl as a very handsome variety, and one that a real fancier of poultry should take pleasure in. A fancier likes to have as many properties as possible to breed for, and the crest, the beard, the feathered shanks and toes, and the fifth toe, though of no practical value, would give him that profusion of qualities that is his special delight. The Sultans were introduced into England by Miss Watts, and were sent to her by a friend from Constantinople in 1854. The name by which they were known in Turkey was Serai-Tăook, Serai being the name of the Sultan's palace and Tăook meaning simply fowl. The Sultan fowl, therefore, is pretty nearly a literal translation of the Turkish name. The Sultan fowl has the reputation of being a very good layer of large, white eggs, a small eater, devoid of the incubating instinct, and an easy and pleasant fowl to manage, which are good characteristics.

Great difficulty has been experienced in procuring fresh blood for this interesting variety, and, as a result, close inbreeding has followed for many years. The fowl has gained a reputation for delicacy which is probably due to the years of inbreeding. But, with the light we have in these days, there need be no difficulty in restoring this breed to vigor. By mating a Sultan cock with Bearded White Polish hens, and Sultan hens with a Bearded White Polish cock, and then breeding the chickens back to pure Sultans, blood could be introduced that would remove all danger of extermination and all fear of extraordinary delicacy. Even a more radical course than this could be pursued. By using the White Cochin instead of the White Polish, and then by breeding back reduce the Cochin blood to one-eighth or one-sixteenth, this variety could be greatly strengthened and invigorated, and, what is really of importance, its size could be increased with no serious detriment to its characteristics. But many fear such radical measures, and allow the breed to run out when the means of saving it are at hand.

One good lesson that the experiment stations are teaching, though evidently making their crosses for other purposes, is that different varieties of fowls can be bred together and still retain many of their characteristics. They only need to carry the experiments one or two steps farther to show how to resuscitate moribund breeds. Dog fanciers have been wiser in their day and generation in this respect than poultry fanciers, for they have had the courage to improve greyhounds by crossing with the bulldog, and have restored one or more breeds, on the verge of extinction, by bold crosses. And poultry fanciers can, if they will, pursue similar methods with success. There is too much blindness in the worship of pure blood. Pure blood is a good thing, but a vigorous fowl, even though it have the bar sinister in its pedigree, is better than a weakling of the purest blood. Strong blood, when the characteristics are rendered certain, is better than weak blood, though the latter be pure, and a cross can be ferreted out in the former by going back four generations. In fact, when characteristics become certain, even though there has been a distant cross, for all practical purposes strong blood in poultry is pure blood.



HIGH-BRED SULTAN FOWLS.

PURIFYING THE YARDS.

B. BEEBE.

Many poultrymen, who keep their fowls confined to small yards, clean the poultry houses, but never seem to think it is necessary to purify the yards. If sickness visits their fowls, it is a mysterious dispensation of Providence, for have they not kept the houses clean! They do not think of the yards, whose soil has become impregnated with the droppings of the fowls, and upon which a green thing is never permitted to grow. Yards need purifying as much as houses need cleaning, only, fortunately, the purification is a less frequent necessity, as the air purifies. The following methods of purification can be recommended:

1st. Where it is possible to do so, seed the yard down to grass or clover and let it bear a crop one year, or raise upon it a crop of vegetables. Of course this necessitates two yards for the fowls, a plan that can not always be pursued. Or one can, with a movable fence, cut off the fowls from the larger part of the yard and sow that to some quick growing crop like oats, and when it has grown five or six inches high let the fowls in upon it. Or one can spade the yard in sections, sowing oats at each spading, and thus secure a little growth from them and a succession of growths of green food for the fowls. A growing crop for one season puts the soil in excellent condition for the fowls, the crop removing just the elements that were injurious to the fowls.

2nd. Spading up the yards every few weeks, either in sections or all at once, turning up the soil to the action of the sun and air. Air is the best disinfectant we have, and plenty of it will help to rob the soil of the elements poisonous to the fowls. Spading will do for a few years, but after a time it will not be sufficient.

3d. The removal and casting away of several inches of the soil and replacing it with fresh earth. It would pay a gardener to do this, as the soil removed is rich in fertilizing matter, but few have been fortunate enough to find the gardener to do this. But even if one has to go to the expense of the removal, it pays better to do it than to have a lot of sick and therefore unprofitable fowls.

4th. Temporary relief can be had by sowing the yards with land plaster. This will hold the injurious emanations and keep the air in a healthful condition.

5th. The soil can be disinfected by a thorough drenching with sulphate of copper diluted in water, about one pound of the former to a hundred gallons of the latter. The soil should be thoroughly drenched.

Of all these methods the simplest is the best—raising a crop upon the yard. It is a pity that it is not always practicable. Poultry keepers, when they begin to erect their plant, seldom look far enough ahead. A little forethought would enable them to arrange their houses so that two yards would be provided for each pen of fowls, and one of them could be kept in clover all the time. The earth would thus be always fresh and healthful, and the clover would furnish the best of green food for the fowls. The labor needed to keep the fowls healthy would be reduced to a minimum, and the care of the fowls would be pleasanter.

KEEPING AN ACCOUNT WITH POULTRY.

JOHN G. PAVEK, NEW YORK.

Under the above heading in the last January number of the AMERICAN AGRICULTURIST a correspondent reports a profit of one dollar and twenty-five cents per hen. I have kept account with chickens for over twelve years, and my experience confirms that statement, for one year, under the following conditions: Young married couple without children living in a village, keeping a dozen hens, the wife naturally careful and fond of chickens, who petted and took such care of young white Leghorn pullets that two of them began laying before they were four months old. Eggs that winter were fifty cents a dozen, the chicken feed did not cost a great deal, as everything in the shape of unusable leavings from the table was given to the chickens as well as green bones obtained from the butcher, which were broken up and fed at intervals.

But let us shift the scene to another actual field and different conditions. The same couple, somewhat older—blessed with two children—increased to five in the next six years—moved to a farm about five miles from the village. The husband is away all day, and the whole care of the family and poultry rests on the wife. She has no time to pamper the chickens, but takes excellent care of them, nevertheless. To keep the poultry now becomes a necessity, on account of eggs and meat. The flock is greatly enlarged; the feed is bought to the best possible advantage, and consists of whole and cracked corn and clear wheat, occasionally being interposed with oats and middlings mixed with boiled potatoes. A great deal of the time, in lieu of water, they receive skim milk and buttermilk. Eggs were sold to the best possible advantage direct to customers at twenty-five cents per dozen for March, April, May and June, the other months at different prices ranging from twenty-five to forty cents per dozen. When there were too many eggs on hand they were traded at the grocery store at current prices, but the chickens were credited with the price charged individual customers. Eggs used at home were charged at the same price. Every egg laid, even stolen nests, though sometimes bad, were credited as above. Every fowl killed was weighed and credited at full price charged in the village market. The following is the total account for each year, with about one hundred and fifty fowls, inventory having been taken on December 31st of each year:

	Income.	*Cost of Food.*	*Profit.*
1887	$300.17	$240.98	$ 59.19
1888	219.03	141.73	77.30
1889	198.66	94.40	104.26
1890	223.69	135.72	87.97
1891	254.27	139.89	114.38
1892	277.69	126.99	150.70
Total	$1,473.51	$879.71	$593.80

The foregoing figures give an average profit of almost sixty-six cents per year per hen. Apparently that is a handsome profit, perhaps one hundred per cent., but, in fact, it is no such thing.

My circumstances were most favorable. Nobody stole any fowls, no time was wasted in going to market with the eggs, as I took them when going to work, no loss through epidemic or by vermin, the grain was brought with other stuff, and no charges for hen house, netting and ground. An occasional feed of oats, middlings and potatoes is not charged against them, nor the value of milk. Now how about the pay of the wife for the care? Surely where she has a family of four or five small children, one or two hired men, and the care of the whole house depending on her, she will have to manage very well indeed, and hurry a great deal to spare the time necessary to look after and attend to the hatching hens and growing flocks. The apparent profit—including the value of the manure—will not pay for the care, capital invested, and risk incurred; but on the farm, chickens are a necessity and should be kept for the welfare of the family. Keep accounts with the chickens by all means, and keep accounts with your live stock, fields, and everything else, and your eyes are liable to open as to where the profit comes from, who earns it, and where it goes.

A VERMIN PROOF POULTRY HOUSE.

B. W. JONES, VIRGINIA

Some years since when removing to a new place where there was a scarcity of outbuildings, our poultry was put into a cellar to roost. The house was an unused kitchen, and the basement walls were of brick. The interior was dry and with a temperature quite uniform the year round, being warm in winter and cool in summer. Altogether the basement proved a very good place for poultry, and after a few months I concluded to fix it up permanently. On removing the former roosts and nests to provide better ones, I was surprised to find that there was no vermin upon any of the timbers nor anywhere within the cellar. The poultry must have had vermin when they were first put into the basement, for the old house from which they were taken showed it plainly enough. I now put the basement in thorough order, everything tidy, with new nests and roosts. From that time on I watched the cellar closely for vermin, but none were ever observed there. I kept poultry in that basement for about six years, a time long enough certainly to test thoroughly the matter, and from beginning to end no vermin was ever seen therein. I am sure of this fact, for the discovery was so remarkable that I made repeated examinations to see if any vermin could be found, and to discover, if I could, the cause of its absence. It certainly was new to me to have a poultry house without vermin, and I never had poultry in healthier condition, or laying better, than during those six years. I found the poultry business both pleasant and profitable. Yet I never could decide what it was that kept the parasites away from the fowls and the house, except it may have been the brick walls, that were always a little cool and moist to the touch of the hand, and probably not suited to the life of the vermin. Whatever the true cause may be, the fact remains that this basement poultry house, with walls of brick, surrounded by earth nearly to the top on the outside, with a good roof overhead, and kept clean and dry, made a roosting place where no vermin would come to feed upon and annoy the fowls.

A SPRING OR WELL HOUSE.

There are numerous reasons why the spring or well from which the family's supply of water is drawn should be covered from the weather—many of which are so patent as to need no mention. An uncovered spring is warm in summer, a receptacle for flying leaves and dust, while in winter it is filled with snow that frequently has to be shoveled out before water can be obtained. Then, again, an attractive little house over a well or spring adds considerably to the appearance of a place, and this is not a valueless factor by any

AN ATTRACTIVE AND SECURE SPRING HOUSE.

means. The little house shown in the sketch could easily be built at odd moments and at a trifling expense, as it is low and but six or seven feet square. The sides should be made of matched boarding, with lattice-work windows on one side and in front, into which windows may be fitted for winter use. The roof should be shingled and stained, with a contrasting stain upon the walls. The foundation should exclude vermin and small animals.

MY GRAPE HOUSE.

ELIZABETH ROBINSON, MASSACHUSETTS.

Although I have been interested in various branches of gardening for many years, my wildest flights of imagination, or utmost heights of ambition, had never led me to think I could grow greenhouse grapes. But when on a visit to extensive grape houses I was told that Black Hamburg grapes were of easy culture, and that any one could grow them, I came home filled with enthusiasm, and eager to try the experiment at once.

In the south-eastern end of our old-fashioned country house was a little door, thirty-six by twenty-seven inches; six inches above the ground outside, and four feet and a half above the cellar floor. Over this door I decided to build my grape house. The

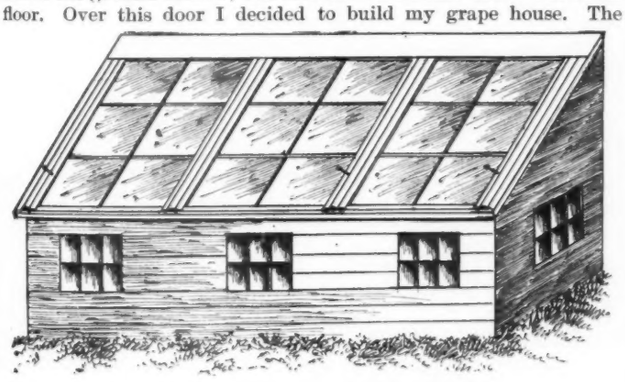


FIG. 1. PERSPECTIVE VIEW OF GRAPERY.

door was rehung to open into the cellar instead of outside. The grape house was to be a "lean-to" without an outside door, to be entered only from the cellar. There was only a small piece of land at my disposal, and my house had to be made to fit that. In our old barn I found many odds and ends of timber and boards, and half and whole windows of several shapes and sizes; these were brought out, and, added to the greatest find of all, three large shop windows. These latter windows had at once convinced me that my grape house would soon be an accomplished fact.

Two of our ancient servitors were secured, one a first-rate carpenter—so he said—but one of the "crankiest" men on record. I shouted out my proposed plan (he was very deaf). "'Taint no sense," he replied. "I want your father to come over and see to this thing," he said about twenty times. Almost in tears, I iterated, and reiterated, that father had said I could have it made just as I wanted it, in the given space, but all to no avail; the "captain" had to appear, and officially give his sanction, before the old man would begin work, which he did with many mutterings of "doing girl's work." I was about worn out in the contest, but taking my seat under a tree not far away, I began to shell beans and keep my eye on the "boss carpenter" and his helper.

It was September and very hot weather, the old man worked steadily, and my little grape house was soon raised. Many were the differences of opinion exchanged before the day was over. I felt as though I had done a very hard day's work. I wondered if all carpenters were so "set." At last the house was finished and the carpenter dismissed, and I felt relieved. I felt very proud of the little building. "Some kind of a new-fangled hen house" the neighbors said. It was not a handsome affair, but it was a very good grape house considering the materials, being of matched boards old and new, a little eccentric in pitch, and except for the three shop windows which formed the top, rather "crazy" as to the glass. These are the proportions: seven feet in height at the back, four and one-half in front, four feet deep and twelve long, fitted firmly and snugly to the yellow shingled end of the house. It looked lovely to me. Then came the preparation, with which great pains were taken, of the border, three feet deep, three feet wide on the three sides of the house. All sods and soil were removed, and new earth from the richest part of the garden put in, mixed with bones, plaster and lots of "good stuff," as old Levi called it. It certainly was a very rich border. The next step was to get the vines, and I foolishly

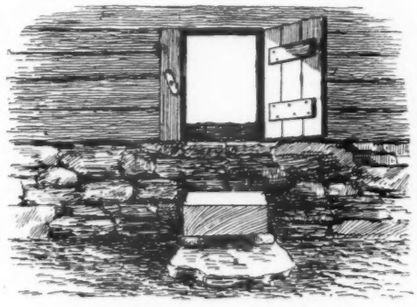


FIG. 2. ENTRANCE TO GRAPERY.

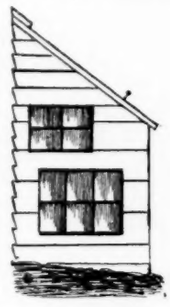


FIG. 3. SIDE VIEW.

bought pot-grown plants three or four years old. I wanted to see something growing at once. The roots were buried in the border outside, and the vines trained up inside. Late in the autumn the border received a heavy top-dressing, and after the ground froze, about six inches of leaves, kept in place by bits of board, were added. The vines were pruned, laid down, and covered with old carpeting. The vines, contrary to my fond expectations, did not bear the next year. One year old vines would have done as well, been better, and cost less. At first my vines bled a great deal in the spring from being kept too warm over winter. I began with seven vines but now have reduced the number to three, and two would be enough for so small a house.

The house is not heated except by the sun, but for four or five years I have succeeded in raising very fair crops of Black Hamburg grapes. After repeated trials I have given up the White Muscat and some other varieties, which grew well but never perfected their fruit. I have no way of keeping an even temperature, and in a long, cold storm the thermometer falls very low. I have gained what little knowledge I now possess in regard to the culture of grapes under glass, from experience, that best of teachers.

At first I made many mistakes; one vine was nearly cut in two by a firmly tied string. I pruned too much, or too little, and kept the house too wet, or too dry. In thinning out the grapes in the bunches I used to handle them freely, which injured the grapes; now I lift up the sections of the branches by a soft string while I cut out the too numerous grapes here and there. Later, as the bunches grow large and heavy, I support them, especially the shoulders, by strings. My grapes are of good size, and generally of perfect color

and flavor, never very large bunches, a pound being perhaps the largest. I have had a hundred bunches of grapes in this tiny house, but fifty are enough.

I uncover the vines early in April and they grow vigorously. Except for an occasional hour or two of pruning, tying up vines and thinning grapes, my grape house does not require over five minutes attention a day, just opening and shutting the top windows, which slide in rude casings and are kept in place by large nails thrust into holes going through casing and window frames. There are three holes in each window sash, one in the casing, and marks are made to show when the holes are over each other and the nails will hold. By keeping the house rather cool, by means of the top windows and cellar door, I prolong my harvest of grapes from the first to the last of September, sometimes later. My grape house when in full bearing is really a handsome sight and the grapes are delicious. I get a great deal of pleasure and recreation from this novel grapery, and find it, moreover, a splendid place to start seeds in boxes quite early in the spring.

FRUIT, FLOWERS, AND HONEY.

E. P. POWELL.

It is all important for our land tillers to combine the culture of a large range of crops. My attention has been drawn quite recently to the possibility of growing flowers as a market product. It is notable that greenhouses are greatly on the increase. Our people not only have learned to use berries and other fruits more largely than formerly, but are much more ready to purchase flowers for table and personal use. That this is a real economy for the users I believe, in the way of health, comfort and good cheer; but what I wish to call attention to is the growth of a new industry for our small-fruit growers and market gardeners. American women are not as ready as German and English women to bear a hand in these suburban ways of winning a living, but they have no prejudice against growing flowers. They may turn their hands to this part of the work, therefore. Every wagon load of produce might carry a consignment of flowers to the city; and this industry might add an important item to the family income. I have a neighbor whose berry crates all summer are accompanied by baskets of sweet peas and roses, placed in trays with damp moss, and then packed in crates.

Fig. 1. VIEW OF A CALIFORNIA LEMON ORCHARD.

Flowers can be easily grown with fruit without requiring much extra culture, or a large amount of room. My own strawberry rows are planted with tulips, which give me thousands of blooms in May, before the strawberries are showing flower. Lilies—especially *Lilium candidum* and *L. Canadense*—grow admirably along vineyard rows. Gladioluses are attractive for market, and require very little space, as they grow erect leaves as well as flower spikes. They can be had in bloom for three or four months, and the bulbs are practically hardy, although generally lifted in winter. There is no reason why we should allow hundreds of dollars' worth of blossoms to waste, when the demand for them is always good. I saw last summer a home that twenty years ago was barely held together by the sale of fruits and vegetables, transformed into an Eden with flowers. My friend showed me with great glee her greenhouses and her violet and rose gardens. The industry had spread, and she was enabled to hire land of her neighbors for growing violets and lilies. The old-time dull and almost profitless gardens and orchards were full of thrift by the skillful growing of marketable flowers.

"Yes," said my wife, one day; "but your neighbors' bees carry off all your honey, which is poor economy." I suppose that each year I am giving away a thousand pounds of honey; for bees get a great deal from raspberry gardens, and from nearly all our fruits when in flower. Clearly here is another economy that our land tillers should look after more carefully. It is not altogether as a market product that honey is valuable, but as a food product for home consumption. It is a concentrated food of the greatest value. Every effort should once more be put forth to make farm life independent. So long as it is dependent on markets, the drop in the prices of wheat, hops, corn and apples bankrupts us. A great diversity of crops, and a purpose to raise as far as possible our own necessities, enable us proportionally to be independent of fluctuating prices. But the bee industry is to be commended as a complementary necessity to successful fruit growing. Many of our grapes are not self-pollenizing. Some of our pears are of the same deficient nature. All fruits are more or less dependent on bees to carry pollen from one to another. I have no doubt but the possession of a small house of bees in the orchard will be worth thousands of dollars to a man who grows half a dozen or more acres of fruit. Some years the need of this help is not so great as in others; but there are years when our fruit crop is lost for lack of pollination. The year 1890 was of this sort; but that year I saw two small orchards loaded with apples; each orchard had a few hives of bees. The cold rains prevented any general and extensive aid from insects until it was too late. This co-operation of industries is of vital importance. It holds the key of the situation. A complete home ought to include the production of nearly all that we need for food and comfort and clothing. In reality we waste, or allow to go to waste, a large part of the natural products of our land. Honey making as an industry should not be separated from fruit and flower growing, or from general farming. The art is easily learned, and in a family of six persons there will generally be found one who finds especial pleasure in bee culture. Fruit, flowers, and honey are a perfect and natural combination of industries. It is not the amount of money that we can make from honey that settles the question, but the fact that what honey we secure is a desirable supplement to our income, and is so much withdrawn from waste. We have the honey if we have the flowers, but we need the bees as extractors and manufacturers, who will store it very carefully for future use.

Sowing Clover Seed.—Upon farming land that is cultivated by crop rotation, clover should be sown if it is practicable to do so. For enriching the soil red clover is no doubt one or the best leguminous plants, as it grows rank and sends its roots down deep into the soil. However, where a permanent pasture or meadow is desired, timothy should be sown with clover at the rate of four quarts of timothy to five or six quarts of clover. The first year the clover will be prominent, the next year less clover, and the third season wholly timothy. For the benefit to the soil the next season after seeding, wholly with clover, if of the medium red variety, it should be cut in June or early in July for hay, and later for seed. This double cropping sends the roots deeper in the soil, which is just what is wanted, and is found to be more beneficial than simply close pasturing. Alsike does well, makes good hay, but does not enrich the soil like red clover. Alfalfa will be the best for dry climates.

LEMON CULTURE.

S. E. A. HIGGINS, CALIFORNIA.

Lemons are grown in Southern California in private gardens, in ordinary orchards, and in large groves. Among the extensive growers who have staked all and won unqualified success, is Nathan W. Blanchard, in Ventura County. Mr. Blanchard set out his orchard in 1874, with Havana oranges obtained in Santa Barbara. It consists of one hundred acres, one-third of which are now in lemons, and is entirely surrounded by wind-breaks of Eucalyptus trees, and divided by the same into strips, about forty rods wide. When the orange orchard was about six years of age and none of the trees were bearing, he budded one thousand to lemons, and these soon began to bear prolifically. Many difficulties were encountered and overcome in seven years of trial and persistent endeavor, which has since that period crowned his efforts with success. Orange roots having proved the hardier, lemons are now budded on orange stock. Orange seeds are sown in a bed in the spring, and left undisturbed till the following spring, at which time they are transplanted into nursery rows. The succeeding fall or spring they are budded. These buds will make an average growth of four feet the first year, but to render them stocky they are topped and are ready for transplanting the third spring, or from twelve to eighteen months after being budded. For final transplanting, each tree is taken with a ball of earth clinging to its roots, incased and securely tied in burlap. If well transplanted in mellow soil not a leaf will droop or wither. The Eureka variety is planted in rich soil, in rows twelve and one-half by twenty-one feet eight inches; the Lisbon fifteen by twenty feet, with the view of removing every alternate tree when the trees become crowded, leaving those then in the orchard thirty feet apart, in triangular form. The cultivator is used after every irrigation, which occurs every month or six weeks. In pruning, the aim is to thin the inside, admitting a free circulation of air.

Fig. 2. LEMON BRANCH IN BEARING.

The Blanchard orchard grows the Eureka lemon, which is seedless as a rule, with a thornless tree: the Genoa, a larger, rougher lemon, nearly or quite thornless, and the Lisbon. The latter is a larger, hardier tree, does not come into bearing so quickly, carries more fruit on the inside branches, and is, therefore, better for the hot valleys. It is also the handsomest lemon and gives more uniform, marketable fruit. The fruit is picked once a month, and a good hand will gather twenty-five boxes a day where fruit is plentiful. The most of the lemons are picked in winter. The lemon is matured and ready to pick when turning from a dark green to a lighter shade. Only inferior lemons are allowed to ripen on the trees unless an east wind occurs, which ripens them with great rapidity, and all lemons that ripen on the trees are retained for the local market or immediate use. Lemons must invariably be handled with great care—as carefully as one would collect eggs—for the skin while green is easily bruised. They are cut one by one from the tree with fruit shears, and placed in a bag suspended from the shoulder of the picker, and the contents of the bag transferred to the boxes on the ground, from whence they are carted, by a truck with springs, to the substantial curing house, in which has been secured an even, cool temperature. They are assorted by graded rings of four sizes; two, two and one-eighth, two and one-fourth, and two and one-half inches. Those that measure two and one-fourth inches and will pack three hundred to a box are taken as the standard size, all others are considered inferior. If smutty, they are washed or scoured with a brush, and laid in layers in the sweat boxes piled tier on tier in the curing-house. If quite green, they will need two months to cure; if otherwise, from four to six weeks; when properly cured, they will keep about four months. When ready for market, the lemons are wrapped in tissue paper, packed in boxes and hauled to the fast freight car. So great has been Mr. Blanchard's success with lemons that he, with others, is setting out four hundred acres farther down the valley, calling the new venture Lemoneira. Other noted lemon orchards are the San Ysidro and the Las Fuentas. The southern coast region of California, being practically frostless, is well adapted to lemon culture, aud in favored situations it blossoms and fruits throughout the year. The lemon, however, will ripen to perfection in a cooler climate than the orange, the sugar in the latter requiring a warm sun. [The accompanying illustrations present views of the California lemon orchards, and of a bunch of lemons as they grow on the tree.]

Selecting Seeds.—Every man that plants seeds, whether for the farm, the vegetable or flower garden, should select those that do the best in the locality where they are to be planted. Different soils require different varieties, and every farmer or gardener should select, after trial, the kinds that succeed best on his land. One of the best guides in this direction is to note the success of the varieties used on similar soils by neighbors; the State experiment station can also usually give good advice.

CULTIVATION OF APPLE ORCHARDS.

DR. H. REYNOLDS, MAINE.

The apple orchards of New England and other Northern States do not receive the cultivation that ought to be bestowed upon them. Many orchards, it is true, are located on such rough and rocky ground, that it would not be possible to cultivate to any considerable extent, but where the land can be cultivated it is highly desirable that it should be. Especially is it desirable that a young orchard should be kept in cultivation until it comes into full bearing, and even after that there are great advantages to be derived from cultivation. Take two young orchards planted at the same time, on equally good soil, with the same care, and equally good trees used for the purpose, and let one be kept in cultivation and the other kept in grass. The result, in ten years, will be a very instructive object lesson. The trees kept cultivated will be nearly full grown or in full bearing, while the trees in the uncultivated orchard will be only about half grown and just beginning to bear. Now if cultivation is good to develop an orchard and bring it into bearing quickly, it is certainly equally beneficial for an orchard during its bearing period.

In Southern California the apple orchards are cultivated and irrigated about the same as the orange groves, resulting in an abundance of fruit. Belleflower apples raised in this way are twice as large as those raised in Maine, and equally as fine flavored, if not superior. Irrigation in New England is not so much needed, of course, as it is in Southern California, but in dry seasons it would be a great benefit. It would save the dropping of fruit from drouth, and enable the trees to bear larger and more perfectly developed fruit. If the surface in our apple orchards were kept cultivated but not planted to crops, the ill effects of severe drouths could be guarded against, to a great extent. By keeping the surface often stirred the pulverized soil of the surface would act as a mulch and prevent the soil beneath from drying up. By cultivating the surface lightly after each rain, the evaporation from the soil would be checked to such an extent that the orchard would not suffer for want of moisture, even in severe drouths. In our Northern States we seldom have drouths lasting more than six weeks, so that by cultivating the surface soil after each rain the orchard would be materially protected from very dry weather.

STRAWBERRIES AND WEEDS.

C. L. HILL, MINNESOTA.

One of the worst things the large grower of strawberries has to contend with is the presence of weeds. With a crop of corn or potatoes, or any annual planted in hills, the matter of keeping down the weeds is comparatively light; for these demand attention during but eight or ten weeks, and close work with the cultivator is about all that is needed. But the strawberry requires one whole season and half of another for the growth of vine and production of crop; and during this entire period, up to the very ripening of the berry, the presence of weeds is harmful. To make the matter worse, since the plants should not be disturbed during the bearing season, the whole work has to be done during the first year. Hence the necessity of the most thorough work from the time of setting out the plants in the spring until the ground freezes in the fall. No intruding perennial weed should be allowed to get a foothold, and no annual to drop its seed. It is toward the latter part of the season that the work becomes most discouraging, and is most likely to be neglected. During the earlier months the weeds may be kept down easily with the cultivator; but as the season advances, and the runners fill up the rows and narrow the intervening spaces, a great many weeds appear that must be removed by hand.

With these facts in view the experienced grower soon learns the importance of beginning a year or two, or even several years, previous to the setting out of the plants, and carrying on a systematic work of ridding the soil of unwelcome seed. For a short course of preparatory work I have found it a good plan to plow under a clover sod, plant to potatoes, and keep the ground free of weeds. If weeds cannot be subdued in any other way, let the potatoes be planted in check rows and cultivated both ways. The next year manure the ground heavily and plant to corn. If the manure is worked into the surface soil after plowing, it will give the seed it contains a better chance to germinate and be destroyed. Keep all the weeds down during the season, so that no new seed may be sown, and the ground will be in pretty good condition next year for a strawberry bed. If the soil needs further enriching I would spread a heavy coat of manure in the fall, let it lie and soak into the ground through the fall and winter, and plow it under the next spring. The soil will then be permeated with richness, while the weed seeds will be buried where they cannot grow.

A friend of mine who has had much experience in strawberry growing, sets out his plants on corn stubble, without plowing. He does all necessary manuring the previous year, and through thorough cultivation gets the surface soil free of seed. He sets the plants along the old corn rows, so there is no marking out to do, and no stubble to interfere with cultivation. As soon as the plants are set out, he runs a narrow-toothed cultivator close and deep, and the soil is made mellow and light. My friend says the plan is a success with him, and that he has no more than half the weeds he used to have. One of the most troublesome of weeds, when it gets a foothold, is purslane. It is a rapid grower, is very prolific in seed, and is hard to kill. To make a bad matter worse, it appears late in the season, when it must be fought by hand. It covers the ground, crowds out the running vines, and occupies the soil at the very time the new plants are forming and trying to get a foothold. I know of one strawberry grower who was actually driven out of the business by the persistency of this little plant.

There is much danger of scattering weed seed on the beds when the fall mulching is done. Cornstalks furnish about as seedless a mulch as can be obtained; but taking everything into consideration, I find coarse marsh hay preferable to anything else I have ever tried for this purpose.

SUMMER CARE OF THE CALLA.

E. E. REXFORD, WISCONSIN.

How to care for the calla during the summer, in the most satisfactory way, seems to be a question on which many growers of it differ. Some keep it growing all through the year, and because it does comparatively well with this treatment, they argue that the proper way is to keep it growing. I do not agree with them, however, because I do not believe any plant ought to be kept growing actively all the time. There should be a period of rest. My plan is to put the pots containing the plants out of doors in June, turn them on their sides under a tree, or in some partially sheltered place, and there I leave them until September, without any attention whatever. After a short time, the foliage turns yellow, and very soon it drops off, because the soil in the pot is becoming dry. In two weeks after putting the pot out, you would not suspect there was a live root in the soil it contains. But the live root is there, all prepared. Of course the soil absorbs more or less moisture from the air, but not enough, in an ordinary season, to keep it from getting as dry as dust. One would naturally think the root would wither away, but it does not. Although the soil about it seems robbed of all moisture, the root holds enough to retain plumpness.

In September I prepare a fresh compost of mucky earth, some sharp sand, and a little loam. If the roots are strong, good-sized ones, I use an eight-inch pot to plant them in. Good drainage must be provided, for, while the plant likes a great deal of moisture at its roots while growing, it does not take kindly to stagnant water about them. Keep the soil moist, or wet, by frequent applications of water, rather than by confining it to the pot by imperfect drainage. An imperfectly drained soil soon becomes sour and heavy, and this induces disease; and an unhealthy calla seldom gives flowers. Plant the roots so that the crown will be two or three inches under the soil, water well, and in a short time young leaves will appear. Then give more water, but do not keep the soil very moist until strong growth has begun. If there are two or three good, strong roots, do not separate them, but give a larger pot, if necessary. I prefer to grow two or three roots of blooming size in the same pot, because the quantity of foliage will be much greater than when but one root is used to a pot, and there will be as many again flowers. If given proper care, a pot containing two strong roots ought to have at least one flower open and a bud showing nearly all of the time from January to April.

Turpentine Products.—Spruce chewing-gum is one of the products of the turpentine still, being simply the rosin from which not all the spirits of turpentine have been extracted, and which have been clarified by especially careful straining through white cotton. The other extreme of the stills' product is the waste-chips, lumps, pine needles and impurities of all sorts which are gathered up in the cotton, and thrown out with it upon the ever lighted fire which burns near-by by day and night, lending a picturesque feature to the gloom of the "piney-woods" of the southern United States.

A FORTUNE IN BLACKBERRIES.

C. E. CHAPMAN, NEW YORK.

One day my wife read to me a description of "The shady glen where the luxuriant foliage of the blackberry glistened with dew in the morning sunlight and shaded the black bunches of aromatic fruit," etc. "That appeals to my imagination," says she; "and to my appetite," says I. "Let's have some." And I at once began to search the papers for a nursery where plants could be bought, without considering that any enterprise rushed into, without knowledge or study, will almost invariably prove a failure. I did not know then that the cheap plants offered were too cheap, and were obtained by plowing up some old plantation, or were of some variety which the owner wanted to get rid of, so I ordered some Kittatinny at a very low price and set them out hurriedly. I had heard that blackberries could not be killed any way, and supposed it was all right to plant them shallow. The growth was feeble, and the next spring one-half of the plants were found to be winter-killed, or rusted. I gave them a heavy manuring, and that year obtained a huge growth of untrained canes, which were nearly all broken down by the snow the following winter.

For several years I kept on making such foolish mistakes, and bought what few blackberries we ate. I was grumbling at "luck" and protesting against "any profit in blackberries," instead of charging my failure to ignorance. I asked a noted fruit grower whom I met at the Farmers' Institute, if my soil was wrong. He said: "Good underdrained soil that will grow corn and potatoes will answer, but should be well enriched one or two years before planting. Sidehill, gravel or stony chestnut loam is best. Varieties differ as much as men. Of course you prune and mulch." That was the first I ever heard of pruning, but I kept "close as a clam," resolving to study a little during the winter. As Agawam and Snyder were recommended as hardy and yielding abundantly, I sent to a reliable nurseryman who advertised in the AMERICAN AGRICULTURIST, and charged enough so he could afford to send prime plants, and I got them. I studied their root system and found they were a deep-rooted plant; that raw manure made a great growth of wood, which did not mature in the fall and would not stand severe cold; that Nature pruned by breaking off the ends with wind, snow, and by borers, which work into the stalk near the top and kill it; that the most and best berries were where the bushes were thickest and where the ground was rich, covered with humus, and shaded by their own foliage.

Then I proceeded to put this knowledge into practice. A piece of sidehill which had been heavily manured for two years was plowed very deep and well worked. Trenches were made with a two-horse plow, eight inches deep and seven feet apart. Two hundred pounds of potash fertilizer per acre was scattered along the bottom and mixed with the soil by running a Planet Jr. cultivator in the trench. The plants were set two feet apart, and great pains were taken to do it well to ensure a perfect stand, as I wanted solid rows, a wind-proof hedge, four feet wide when two years old. When the new growth was eighteen inches high the first year, and two feet the second, the shoots were clipped off, which caused the laterals to start. This was repeated every week to keep the growth down. This pruning causes fruitfulness. In the illustration, engraved after a photograph, is shown one side of three bushes. The two at the right are covered with fruit, while the one at the left, which is unpruned, has but few. The difference in yield was at the rate of $800 per acre. Pruning also lessens loss from breakage by snow, wind and winter-killing. The fruit is gathered faster and is larger. Plants, as well as animals, must have a generous supply of fresh air and sunshine in order to reach the greatest vigor.

UNPRUNED AND JUDICIOUSLY PRUNED BLACKBERRIES.

The cultivator should be run very shallow so as not to injure the roots, but must follow after every rain to prevent evaporation. In spring a light dressing of a good commercial fertilizer is worked in around the plants. If the growth of canes is satisfactory, only potash and phosphoric acid are used at this time. Immediately after fruiting cut out all old canes and burn. Sources of disease and insect foes are destroyed, the energies of the plant are all devoted to the new growth, and there is more room for cultivation. No weeds should be allowed until after fruiting, when they do no harm and help enrich the soil when cultivated under the next spring. During winter mulch heavily with swale hay or straw among the canes, and leave it there until rotted. In proof of the efficacy of this method, I may state that on a measured half acre of land one picking gave one hundred dollars' worth of berries, and the return for the entire season was five hundred dollars.

IN THE HAY FIELD.

S. D. PENTLAND, NEW YORK.

All preparations should have been made before the commencement of haying for the expeditious gathering of the crop. All the machinery should be in order, extra sections and guards placed in the tool box of the mower, a good quality of oil obtained for lubrication, and all bolts made secure. If any of the nuts are liable to work loose, either from constant jarring or because the bolts are covered with oil, this may be prevented by cutting the thread on the bolt above the nut with a cold chisel. This not only prevents their coming off, but keeps them close fitting. A leather washer may be placed between the nut and bearing surface for the same purpose, or both methods may be used.

Unless there are strong indications of several days of pleasant weather, it is best to run the mower not later than noon, putting up in the afternoon what has been cut of timothy or of thin clover. If there is a heavy growth along the fence, it is best to let it remain uncut until that along the border of the field is bunched, for, unless spread out evenly, it will dry very slowly and be hardly fit to haul with the rest. If the field be large and quite level, it is better to cut around it than to cut all from one side or end, as the farmer has free access to all portions of the remainder. Even if the weather is fine, insist upon the hay being put up in a good, substantial manner, and all cocks well topped out, and if light and loose have the men press each one down before putting on the last forkful. It will thus better withstand a heavy wind or prolonged rain, and one is often obliged to leave the hay in the field longer than was at first intended. If there is a drying wind, the hay should be raked into windrows an hour or two before being bunched.

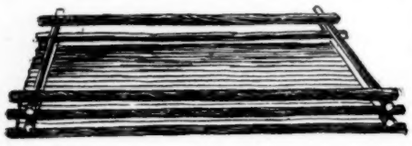


FIG. 1. RAIL FLOOR FOR HAYSTACK.

Hay may be hauled quite green if spread about the mow or sheds, a load at a time, being careful not to tramp or press it down after being thrown back; or if old hay or straw be placed in layers between every layer of green hay, but little danger will be experienced from heating or mildew. The dry material absorbs the moisture and flavor, rendering it more palatable for all kinds of stock. Wherever possible, a horse fork should be used, as it not only relieves the farmer of one of the most laborious operations of haying, but materially expedites business, which is a great point to be gained in a busy time. Considerable care should be exercised in mowing away after a horse fork, or the mow will be uneven, entailing considerable trouble in removing it, either for selling or for daily feeding to the farm animals.

STACKING HAY.

CHARLES E. BENTON, MASSACHUSETTS.

In stacking hay, as with everything else, it is important to begin right. The old way was to build the stack directly on the ground, and afterward with a hay knife to cut under the edges so that they should not be frozen down in the snow. This involved considerable labor, and was also open to the objection that the hay would absorb moisture from the ground, and usually at least half a ton of it would become moldy and spoiled before it was used. With twenty-five rails a stack bottom can be built that will save the hay from waste, and also save the labor of cutting out the stack.

FIG. 2. BUILDING THE STACK.

Begin by putting down a flooring of rails laid close together. On this floor build a crib, "cob-house fashion," two rails high, as shown in the illustration, Fig. 1, placing the best and heaviest rails on top. This bottom makes a firm foundation, that not only preserves the stack from the damp ground, but also holds up the outer edges so that they shall not be snowed under. In beginning the stack on this rail bottom, care must be taken not to enlarge too rapidly as it is built up. Such a mistake is frequently made by beginners, who fail to keep in mind that while the stack is being built, it is constantly settling. This is shown in Fig. 2. The lines *a*, *a*, show the gradual increase of diameter while the stack is being built, but by the time it is completed, this portion has settled to the position indicated by the dotted lines, *b*, *b*. The stack should enlarge gradually in building, as indicated, until at eight feet from the ground a width of twenty feet is reached, while the square form of the bottom should be modified to the round form. When this size is reached, it is large enough, and should then be continued nearly of the same size for a short distance more, and then be gradually drawn in. Inexperienced persons are often troubled by the stack leaning to one side. A stack has been known to tip over before it was finished. This trouble is always caused by uneven treading of the hay. A beginner frequently stands in the middle and places the hay around him, but exactly the opposite course should be pursued. The stacker should walk slowly round the outer edge of the stack, laying the hay in courses, until it is well above the shoulder, after which he should remain nearer the middle. Fig. 3 shows a section of a stack built in this way, the shaded portions indicating where it was trampled more compactly in building. In the upper portion the center is kept hard, so that in settling, the hay on the outside droops a little, and thus sheds water more perfectly. A stack built in this way will never tip over or settle to one side. It is an excellent method to leave a small piece of swale or lowland grass. After haying, cut this, and, without waiting for it to cure, put it on the wagon while yet green, and proceed to "top" the stacks; that is, repair and build up their tops wherever they have settled. A stack, when completed, should approach in form very nearly to that of a hen's egg standing on its large end. When this is finished, secure it against high winds by putting on "hangers." These are readily made by connecting the ends of two light rails with a piece of No. 10 annealed wire about six feet long. Hang one pair of these across the stack from north to south, and one pair from east to west, and the top will not be likely to blow off. A great convenience in haying is a stack cover. I had an excellent one made in a sail loft. It is of light sail cloth or cotton duck, eighteen feet square, with a rope in the edge to keep it from tearing, and a hole worked in each corner. Selecting four stones of convenient size, I fastened a hook to each one with a piece of wire, and use them for weights. Whenever it becomes necessary to leave a stack unfinished over night, or longer, I round it up and put on this cover, which gives perfect security from storms.

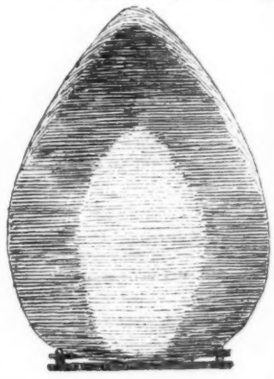


FIG. 3. SECTION OF WELL-BUILT STACK.

SUCCESS WITH RUTABAGAS.

HERBERT W. MUMFORD, MICHIGAN.

It is somewhat strange that more roots are not grown throughout the United States, since their value in making up a winter ration for stock is so generally recognized. It cannot be because climatic conditions are unfavorable, for in nearly every locality roots can be, and are, economically grown. Although the sugar beet is more nutritious for feeding than the rutabaga, I grow the latter almost exclusively, as I have found it best adapted to our locality and soil.

A rich and sandy loam, free from stones, should be selected, if possible, for growing rutabagas; give the ground a liberal dressing of barnyard manure and plow it under deep. Hard-wood ashes, salt and land plaster I have found very beneficial, and have applied them, about two weeks before sowing, and in the following proportions,—unleached hard-wood ashes fifty bushels to the acre, of agricultural salt two hundred pounds, and land plaster one hundred pounds per acre. After the soil has been properly prepared, about the middle of June, I drill in the seed with a common garden drill. About three-quarters of a pound of seed to the acre is required, leaving the rows from thirty inches to three feet apart.

Last season, as soon as the plants were up so that the rows could be followed nicely, I began working close up to them with a Planet Jr. hand garden cultivator. This I found to be an excellent practice. In former seasons I have waited until the plants were large enough so that I could cultivate with a horse hoe, but the weeds get a firm foothold by that time. The use of the hand cultivator, although somewhat laborious and tiresome, is to be on the whole

recommended, following it up as soon as possible with horse cultivators. The weeds must be mastered.

After the first cultivation with the horse tool, I hand-weed and thin the roots so as to leave one plant every ten inches in the row. This weeding and thinning must not be neglected, as thus early it can be done much cheaper and more rapidly than later in the season; and also because it gives the plants remaining a good chance for early growth. From this time on they should be cultivated carefully each week until the roots attain considerable size. It is often necessary, and usually pays well, to hand-weed a second time later in the season. By following the methods given above as nearly as may be, I have never failed in raising a crop of roots, no matter how dry or adverse the season may have been, and have secured a crop which has been ample to reduce the cost of production to a satisfactory and profitable basis.

A NEW DOUBLE FLOWERING PEACH.

The accompanying illustration, drawn and engraved after a photograph received from P. J. Berckmans, Augusta, Ga., represents a beautiful new double flowering peach, originated in South

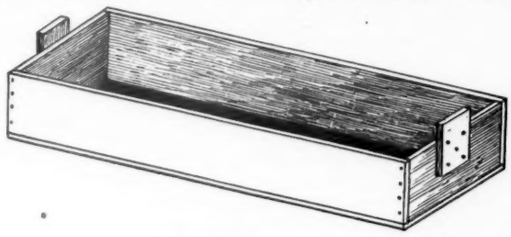
NEW DOUBLE FLOWERING PEACH.

Carolina. The original tree is now four years old. The flowers are pale rose, outer petals entire, center petals quilled, like some varieties of chrysanthemums, and forming a raised center. This novelty is a most remarkable flower and very attractive.

A Useful Weeding Tool.—A weeding spud should be found on every farm and be put to frequent use. One may easily be made from a hoe handle four and a half feet long and an old large chisel. Have a blacksmith draw the chisel so that it will be two and a half inches wide at the cutting edge, one inch wide at the shoulder and seven or eight inches long from shoulder to edge. It should be sharp and not over a quarter of an inch thick in any part. Fastening the chisel to the handle completes a light and very effective tool. By the skillful use of it one can cut off all kinds of weeds, even burdocks with roots two inches in diameter. When using it always carry a small file to keep the edge sharp, to do good work.

CONVENIENT PICKING AND STORAGE BOX.

In gathering fruit and vegetables, a picking box will prove very convenient. It should be made to hold one bushel, and, as the material used in its construction can be obtained for about ten



A STRONG BUSHEL BOX.

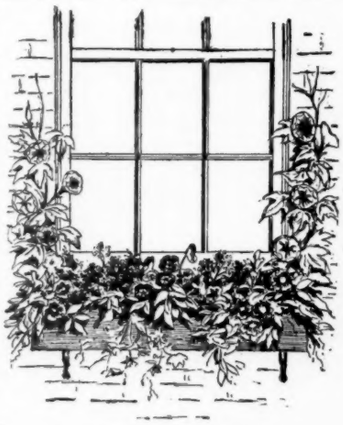
cents, it proves a cheap arrangement for the purpose, as it can be nailed together when other farm operations are not pressing. Many farmers who appreciate their value have more than fifty of these light boxes. In gathering potatoes the boxes are filled and left about the field, a low wagon or stone boat being driven around and loaded with them without heavy lifting. For storing apples and potatoes they make a handy package, as they can be piled up in the cellar in tiers, six or eight deep. Thus they are convenient for examining the contents, and allow thorough and complete ventilation, two very important considerations, as all know who winter these fruits and vegetables in their own cellars. The names of the different varieties are readily inscribed upon each box. The handles are pieces of soft wood, four inches square and one inch thick, firmly nailed in place, so as to project about one and a half inches, as shown in the above illustration.

WINDOW-BOXES FOR FLOWERS.

EBEN E. REXFORD.

In the city, where it is impossible to have a garden, there may still be quite a substitute for it in the form of a window-box, and this substitute may be enjoyed by the occupants of upper stories as well as by those living on the ground floor. A window-box that will grow plants quite as well as the elaborate and expensive boxes used by wealthy people, will cost very little. The box should be as long as the window is wide, or a little longer, and about a foot wide and a foot deep. Fasten it level with the window sill, or just below it. For support, use iron brackets, which can be screwed to the wall just below the box, or by braces of wood running from the outside of the bottom of the box to the wall, set at such an angle that ample support will be provided. A few nails can be put through the box into the sill or side of the house, to give additional security and firmness. Any boy ten years old can put the box in place, if you furnish him with a saw, a hammer and some nails to work with. Packing boxes of about the right size and shape can be bought at many of the dry-goods stores for a small sum.

When in place, fill it with the best soil you can get—the richer the better; but if you cannot get such soil, use whatever is at hand and depend on soapsuds and the like for food for the plants. The best annuals for use in window-boxes are: For flowers — petunias, phlox, calliopsis, sweet alyssum and nasturtiums; for fragrance — mignonette; for training up and about the window — morning glories. Among other good plants, not annuals, geraniums, both double and single, are excellent; also verbenas, heliotrope, and roses of the everblooming class. If I wanted a window-box that would be as near perfection as possible in the beauty and fragrance of its bloom, I would have a *Perle des Jardins* rose—rich yellow and very sweet; a few dark purple and a few pale yellow, white, and sky-blue pansies, a heliotrope, some mignonette to droop over the sides of the box, a rose geranium, and morning glories at the ends to train up over the window. You



A PRETTY WINDOW-BOX.

would not be likely to get as many flowers from such a selection as you would from annuals, like those named above, but what flowers you did get would be so choice, so exquisite in color, sweetness, and form, that you would find them more satisfactory if you are at all fastidious in this direction. From such a window-box one can cut a dainty buttonhole bouquet every day during the season, if it is properly cared for; and what could be lovelier than a yellow rose-bud and a purple pansy, with a geranium leaf, or a cluster of pale yellow, white and blue pansies, unless it is a Perle rose, just opened wide enough to give you a glimpse of its golden heart, with a cluster of lavender heliotrope?

"There is a knack in growing plants in a window-box," said a lady to me, not long since. "I can't do anything with them, and I know a good many other women who can't." To which I reply that the only "knack" consists in taking proper care of them. The principal cause of failure comes from neglect to give enough water. A window-box is exposed on all sides to the action of wind and air, consequently evaporation of moisture from the soil is very rapid. If a basin of water is applied, the soil will look wet on the surface, but it penetrates to but a little depth, as the amount of earth contained in one of these boxes is considerable. Arguing from the surface appearance of the soil that there is moisture enough, the owner is content with the daily application of a basin of water, and soon the plants begin to turn yellow, and in a short time they fail wholly. Examine the soil in a box whose plants behave in this way, and in nearly all of them you will find that below the surface the earth is as dry as dust, and you will no longer wonder why your plants failed to grow and do well. To keep the soil in a box of the advised size properly moist all through during our hot, windy summer weather, at least a pailful of water should be given every evening. You need have no fear of giving too much, as all the water that the soil cannot take care of will run off through the cracks at the bottom and ends of the box. Keep the ground always moist all through, and you can hardly fail to grow fine plants in a window-box, provided your selection is a good one. For trailing plants to droop over and cover the sides, you can use tradescantia, moneywort, othonna, or blue and white lobelia. Madeira vines can be festooned about the box, or trained up and about the window. I prefer morning glories, however, because of their exquisite flowers. They should be grown from seed planted at the ends of the box. If a canopy is made of sticks, or lath, or something similar, to fit the top of the window, sloping downward and outward like an awning, when in position to keep out the sun, and the vines are trained up to and over it, the effect will be most charming from within or without, and you will have a delightful shade for your window. With a box of "green things growing" at your window sill, high up above the dusty street or highway, you will have a bit of summer beauty all your own, and it will afford you a world of pleasure. And the beauty of it is, any one who will go to a little trouble can have it. A window-box is everybody's garden.

HELIOTROPES.

LENNIE GREENLEE.

No special season of the year can claim the heliotrope; it will be fair with bloom at any time for which it may be treated. In winter its deep purple, light blue or lavender flowers will be produced freely on any warm, sunny window-sill, and if the plants are bedded in a warm, rich spot outdoors in summer their growth will be luxuriant and the flower trusses large and beautifully colored. The plants are easily grown from seed, but propagation, by means of cuttings, is generally preferred, because it is more rapid and gives less trouble. It is better to grow new plants every few years, if one has but limited space under glass, as the old ones, even with severe cutting back, will become shrubby and scraggy in time, requiring too much room, and giving smaller flowers than young plants. Where there is plenty of room for them to spread their branches and develop symmetrically old plants of heliotrope make beautiful specimen plants, filling the air around them with the delightful perfume of their rich flower masses.

In order to root quickly, heliotrope cuttings must have a sunny place near the glass, and the sand in which they are inserted must be kept constantly wet. Small cuttings from the young and tender wood form roots rapidly and make strong, healthy plants for midsummer bedding, if struck late in winter, or early in spring. From the cutting bench, box or pan, they should be potted off into thumb pots of light, rich soil, and given plenty of water, light, and as moist an atmosphere as possible. They will need frequent shifting into larger pots, as the roots fill the soil, and the tips of the branches should be pinched back evenly now and then to give the plants a symmetrical, branching shape. They will begin to bloom when but a few inches high, and may be bedded out as soon as the weather becomes warm and settled. Heliotropes will not endure the slightest touch of frost. The bed should be located in a rich, sunny part of the garden, made deep and mellow, and well drained. The plants should be placed about a foot apart, if they are young ones from cuttings. If turned carefully out of their pots they will need no shading, but in dry weather they have to be watered thoroughly every evening after sundown, soaking the soil to a depth of six inches or more; for heliotropes have a thick mass of fine, fibrous roots which must be kept moist, or the leaves will curl and drop off, and the blossoms be few. The plants are gross feeders, and like a rich soil. Sand, leaf mold and crumbling old manure in equal parts makes the best compost for them, but they will accommodate themselves to other mixtures. What they do require for their best development is a rich soil of some sort, thorough drainage, an abundant supply of water, and full sunlight.

If the plants used for summer bedding seem likely to be too large for the space which can be given them for winter blooming, cuttings started in midsummer will form good winter bloomers; or a few old plants may be cut back early in fall, lifted, and given especial care to make them presentable and ready for continuous winter bloom. As soon as new growth and buds start, liquid manure given once a week will be of much benefit. The temperature in which heliotropes are grown should not fall below forty-five degrees at night, and from sixty to sixty-five degrees is a good average for the day. Of course in moist atmospheres the plants will thrive with more heat, but it is not an easy matter to keep the air moist in a sitting room. Wet moss and sponges scattered about among the pots, frequent showering of the leaves, and pans of water evaporating on top of the stove, are devices which help to keep both plants and human inmates of rooms healthful. In too warm and dry an atmosphere heliotropes drop their leaves and refuse to grow or bloom. The best way to water a potted plant of heliotrope is to set the pot in a basin of tepid water and let the soil absorb moisture through the drainage hole until the surface becomes quite moist.

Insects seldom infest heliotropes that are grown outdoors. When the greenfly troubles plants in the window it may be driven off by syringing the leaves with very weak tobacco water; if too strong, the liquid will burn the foliage. The strength of the infusion should be tested by dipping some other tender leaf into it and watching to see if it turns brown. Fumigating with tobacco is also a good remedy for greenfly, but it is apt to injure the foliage of heliotropes.

THUMB-PRUNING TREES AND SHRUBS.

"Nip it in the bud," is an old saying, but contains a remarkable amount of good common sense, and when the application is made to tree growth, it is of great importance as regards the future shape, value and health of the tree. Upon the large limbs and trunks of trees, buds are pushed forth that, if not removed in the early stages of growth, will cause an unsightly tree. If left several years before removal, it may result in the decay of the tree at the point of removal, or, if allowed to grow and become a part of the tree, will often make it a difficult matter to reach among the limbs to gather the fruit. All of this trouble may be avoided by promptly pinching or rubbing off the out-of-place buds as soon as they appear. On trees planted only a few years, this is an easy matter. An active man will hand-prune many small trees in a day's time, and it should be done several times each summer for these succulent growths are not confined to spring or early summer.

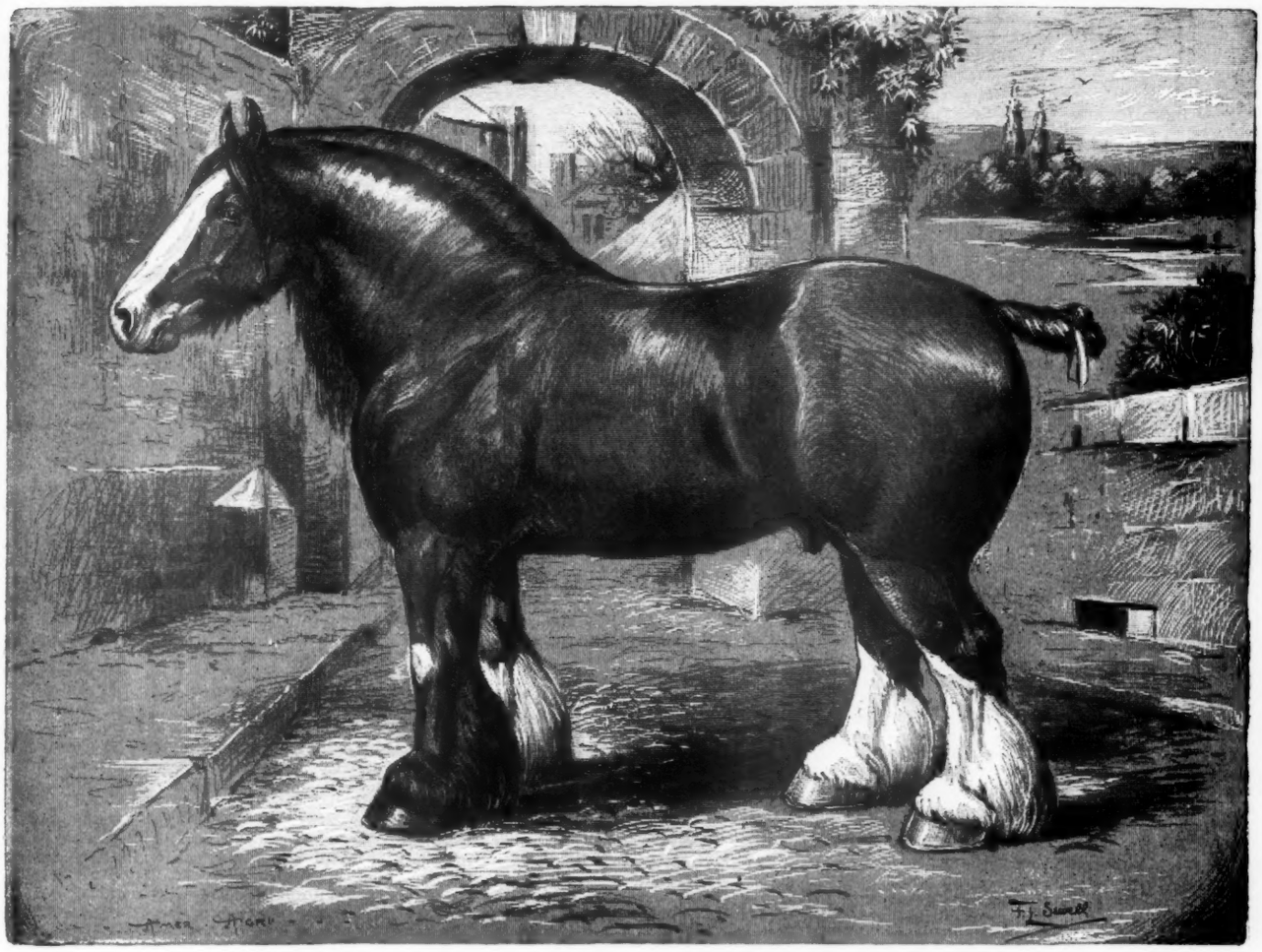
Setting Fence Posts.—Posts that are to be placed in a clay soil which is liable to heave by the action of frost, will retain their original position longer if they are set in dug holes instead of being driven. Unless all the sharpened portion is placed below the action of the frost, and even then, if at the time of freezing the soil is soaked with water, the action of frost is liable to raise the post upward. However, as soon as frost leaves the soil a few blows on top of the post with a heavy maul will return it to its original depth, which could not be so easily done if the post was square at the bottom, as earth would fall in the cavity. On most soils sharpened posts are best, and when of durable material like cedar, oak or chestnut, and where the fencing material is wire, a post four inches in diameter will last as long and be just as serviceable as one six or more inches in diameter, and the cost is usually less.

SHIRE HORSES AT HOME.

GEORGE A. MARTIN.

England is the native home of the Shire horse, though representatives of the breed are found in increasing numbers throughout the Greater Britain which extends around the world. Within a little more than the present decade, they have been imported to and bred in the United States, until they now form an important element in the equine stock of this country. But it is in England that Shire horses are most commonly seen and most highly esteemed. Whether they were bred from Flemish horses brought across the channel in years long bygone, or descended from the chariot horses which proved so formidable to the invading legions of Julius Cæsar, need not be discussed here. Whatever their origin, they are now the great draft horses of England. Much interest is shown in their breeding, the Shire Horse Society numbering among its active members the Prince of Wales, many titled noblemen, baronets, and large numbers of men eminent as breeders. Recently six hundred and forty Shire horses of various ages, including foals, were sold for an aggregate of $250,000, or nearly $400 each.

The great annual event for the breed is the London Shire Horse Show, at the Royal Agricultural Hall, Islington, usually held soon after the middle of February. The entries during the past five years have averaged five hundred and thirty-seven in number, and the attendance every year is very large, including all sorts and conditions of men, from royalty to stable boys. In the fifteenth annual show, held last February, the entries numbered four hundred and seventy-five. The falling off from the average of the five years was principally in the classes for three and four-year-old stallions, while the class for aged stallions over sixteen hands and two inches had an increase of sixteen above the previous year, the total number being fifty-one head. It was in this class that the stallion Bury Victor Chief, whose portrait is given herewith, was entered. The numerous class was weeded out until only fifteen remained in the show ring, and these were further reduced to eight. Then the first prize was awarded to Bury Victor Chief. But a still higher honor awaited him. After a long and exciting deliberation the championship cup for stallions was awarded him, amid the cheers of the spectators. This was his fifth contest and triumph in the Agricultural Hall. He won the first prize as a yearling at the London Shire Horse Show in 1890, and as a two-year-old in 1891, he was first and champion in 1892. The latter event is thus described by an intelligent British writer: "The excitement in the contest for three-year-old stallions ran very high because this was the first appearance for the season of the marvelous Bury Victor Chief, who had retired with an unbeaten class record the previous year. He was very quickly placed at the head of his class, and afterwards as the champion of the show, which must have been most satisfactory and gratifying to Mr. Wainwright, who had so pluckily paid 2,500 guineas for him. His general contour, feet, pasterns and flat bone are about as near perfection as one can make them; his breeding is undeniable, and he promises to be one of the best of the good sires, for the only two of his foals that have ever been offered by public sale made over three hundred guineas." He has thus far fully redeemed the promise of his youth. Of his appearance in his present form, the *Live Stock Journal* says: "This horse is now five years old, and is wearing uncommonly well—much better than many people expected he would do when he was a younger horse. His feet are strong and healthy, and of plenty of size, his pasterns are good, and his big, flat and well-proportioned bones show sufficient quality for their size. He has an extra short back and powerful loins and quarters."



ENGLISH SHIRE STALLION, BURY VICTOR CHIEF (11,105).

Bury Victor Chief (11,105) was sired by Prince Victor (5,287), dam Bury Daisy by Chatteris Le Bon (3,023). He is owned by Mr. Joseph Wainwright, Bowden Hall, Derbyshire. The stallion is black with a white blaze, three white stockings, and a white spot on the left knee. Taken altogether, he may be regarded as a typical example of the Shire horse, and as such his likeness is presented.

HOUSEHOLD

Politeness at Home.

MAY SILVERS.

The position of a mother is no sinecure. She must never be caught napping at her post of duty. She must not only stand ready with "Line upon line and precept upon precept," but she must so sugar-coat this disagreeable medicine to childish palates that it becomes a pleasure to take it. It was a wise mother who taught her son to brush his teeth regularly by refusing to give him his morning kiss until that duty had been performed, but it is necessary to first instil a desire for the kiss. Kiss your child every morning and he will be most likely to look for and prize this mark of your affection. Forget it yourself and he will forget it also.

Table etiquette must be taught at home and you cannot begin too early. If it is necessary to bring a two-year-old child to the table it is also necessary to teach him to eat with some regard to the laws of decency. Do not imagine that he is too young to learn good manners. He will learn them much more readily at that age than he will at ten years, by which time, if he has not already acquired them, you will often have to blush for him. When I was a child my father would have reprimanded me severely for seating myself at table before the older members of the family, but nowadays it is too common to see children scramble into their seats without the slightest regard to this point of politeness. It is a simple and graceful thing to say "good night" to superiors, equals, and inferiors alike, but, it is safe to say, that if your two-year-old baby does not do it your fifteen-year-old girl will be likely to omit it at times, or even altogether.

Acquiring and spending should go hand in hand. When a child is old enough to spend money it is well that he should learn its value by being taught to perform easy tasks, for which he can be paid. At the same time it is sometimes a dangerous precedent to pay children for the performance of duties which should fall to their share whether they are paid for them or not. When it is desirable that they should earn money in order that they may somewhat appreciate its worth, give them some rather unusual task for which you can conscientiously reward them. If a child is inclined to be lazy, teach him to enjoy work. This may not be an easy task, but woe to him and to you if he grows up feeling that work means martyrdom. "But it is much easier to do it myself," says some quick, impatient woman. That is just where a woman's martyrdom to her sense of duty comes in. You must literally stand by, if need be, while your child performs slowly, unwillingly, mayhap unwillingly, something that you yourself would much rather do, but this sacrifice you must make to his moral training, and then you must assume a virtue if you have it not, and stimulate him to well doing by profuse thanks and by making much of the service he has done you. It sometimes takes just a wee bit of hypocrisy to be a successful mother.

But of all the lessons you must inculcate there is none so important as self-control. It was a baby of less than three years, whose mother has already begun to teach him this very important virtue, who awakened one day from an unusually short nap, and in an unusually cross mood. "Ted," said mamma, "You are cross." "Put Ted back in his crib mamma," said this young philosopher "until he dets a dood boy;" and back he went for half an hour or so, until he bobbed up serenely with "Now, I'se dood," and he was. A boy is never too young to be taught to open a door or a gate for a lady; to remain standing until she is seated, and to take off his hat in her presence. On older children one must remember to impress such points of etiquette as that it is not good form to congratulate a bride. You wish her happiness and congratulate the husband. That the proper form of introduction is to present a gentlemen to a lady—never a lady to a gentlemen. That it is not good taste to appear absent-minded in company, and that in leaving an entertainment you must first take leave of your hostess and afterwards of other members of the circle.

Mexican and Indian Handicraft.

JAMES KNAPP REEVE.

Household handicraft is a thing not very much known or practiced in our country. Every manufactured article that we use is the product of some factory where skilled workmen are gathered, and their labor so combined and controlled as to produce the desired results with the greatest economy. There, machines take the place of tools, and individual skill and proficiency are largely lost sight of. In Europe, and especially in remote and mountainous districts, workmen who are skilled in the use of hand tools often stand in high repute among their fellows, and in many a sequestered hamlet every home is a workshop, and every member of the family a workman. In the Tyrol and in the Hartz mountains, much delicate wood carving and many curious toys are produced in the homes of the people, and, indeed, this is often their only means of support.

Traveling recently through our Southwestern territories and in Mexico, I was interested to find something of the same condition prevailing there. Everyone who has been in El Paso, in Santa Fe, and other cities of the great Southwest, has doubtless observed the feather work, the finely-woven baskets, the delicate filigree-silver jewelry, the crude pottery, and the clay statuettes with which the curio shops are filled. But probably not many have stopped to think that this is all wrought in the homes of the natives—Indians and Mexicans—and is as truly handicraft work as are the toys and carvings of the Swiss and German peasants. The word "home," however, is almost a misnomer for the habitations of these people; many of them verily deserve it the least of any of the dwelling places of men. I have seen Indians, seated before their wick-i-ups of mud and wattled branches, weaving, with wonderful skill and patience, baskets so fine and close that water could be carried in them. And Mexicans, before their brown adobe huts, molding from the same clay that makes their ugly houses, artistic little statuettes that portray most faithfully the native types. If you should speak of art to these people they would not understand you. They have had no teachers and no rules to guide them in any of their work, but are either self-taught or else pursue avocations that have been handed down from father to son. Their occupations are followed only in the most desultory manner, for industry is not a characteristic of the native population of hot regions. As a rule, they work when they need food, and at other times idle in the sun.

It is curious to see how little they rely upon tools, this requirement of more cultivated mankind being supplied by the greater dexterity of their fingers. It is almost only when shaping metals that they avail themselves of such aids. When they do resort to tools, a few go a long way. In the harbor of Vera Cruz is a prison where the Mexican State prisoners are confined. The prison is a horrible dungeon, and the prisoners are kept in idleness. Cocoanut trees abound upon the island, and to relieve the monotony of their confinement, the men carve these nuts into many curious and fantastic shapes. No tools are permitted them, and as a substitute, pieces of glass and bits of sharp stone are used. Some of the shells are carved into minute lace work, yet kept entire, and the contents deftly extracted. So finely is the tracery executed, that it would do credit to workmen supplied with the best of tools.

That which has interested me most is the "plumage," or feather work. In this they produce all the effects of a beautiful mosaic. Taking the feathers of all kinds of birds, from the gorgeous plumage of the peafowl down to the soft down of the humming-bird, they glue them upon a fine cotton web and so produce mantles, and even dresses, altar cloths and hangings for the temples, and ornamental pieces of various kinds. Often they will reproduce the bird in relief, giving it form and color as in life. This feather work is almost wholly done by the Indians, among whom the art has existed for hundreds of years. Much beautiful work of the same sort was formerly done by the Seminoles among the Everglades of Florida, but that State has recently prohibited the killing of birds for such purposes, and during an extended stay among them I was unable to find a single piece of new work, so well is the law enforced.

Next in artistic importance I would place the "figures de trapo," or rag figurines, as they are termed by the dealers. The substance used in making the figures is the viscid exudation of a tree similar to the India rubber tree. This is mixed with the proper proportion of hard black wax which is needed to render them rigid when cold. After preparing the material, a human figure is modeled and the surface then covered with cloth so dextrously as to represent the skin. Eyes of glass are inserted, and the figure then costumed to represent some national type. This latter fact is worthy of especial comment, as the figures thus become doubly representative, in the manner of their manufacture, and in that which they portray. Every class of artisan and laborer in Mexico is shown, and every representative type that you would meet in a journey through the Republic.

The Uruapan Indians have a craft peculiar to themselves, the making of lacquer work. Upon a rough hewn plaque, or a gourd even for a base, a ground color is laid, of which the pigments and preparation are a secret of the tribe. This is left for six days to dry, and then a flower or other ornament is cut out and the space filled in with color. A single color is applied at one time, and, after that has dried for six days, other ornamentation is cut and filled in like manner. Thus a design in lacquer is produced that is as durable as the Japanese. Seeing what these people have accomplished, the wonder is that they have not accomplished more. Their natural aptitude for handicrafts that so nearly approach the arts, suggests that education and intelligent direction might make of them a race of artistic craftsmen. But it is probable that they will never be better than they now are, nor indeed so good very long, for education and civilization will drive away their natural artistic instincts and give nothing in the place. They are artists and craftsmen only so long as they can be vagabonds.

Renovating Done Here.

MRS. E. M. LUCAS.

People who are not accustomed to make ingenuity take the place of money, are apt to despise "make-overs," and think there is no possibility of rejuvenating little girls' half-worn, outgrown dresses; but the experience of an economist can tell a different tale. To illustrate, I will describe the renovation of a dress of dove-colored wool goods, which my little daughter, aged seven years, had entirely outgrown. The deep hem of the skirt could be let down, but the bodice had shrunk considerably in washing and was consequently too short waisted, and too tight across the chest. Among my resources was a small roll of peacock blue cashmere. A pointed vest slightly shirred at the neck, was made of the cashmere, and inserted in front, this enlarged it considerably. Deep cuffs, also of the cashmere was added to the full sleeves to lengthen them. The bodice was then ripped from the skirt, lengthened with a piece of stout cambric, and the skirt was then gathered and sewed on again. To cover this piecing a pointed girdle was made of the cashmere. A tiny choker of cashmere was sewed in the neck and a frill of lace added a dainty finish. A row of herring-bone stitches was worked with embroidery silk, matching the cashmere, on each side of the vest, girdle, and cuffs. After facing the skirt around the bottom, a row was also worked where the hem had been. The dress was now really prettier and more to the small owner's taste than it was in its first estate. Calico and wash dresses can be renovated without a great deal of trouble. I do not think it pays to spend much time on old calico dresses, but with the sewing machine much can be accomplished in a few hours. The heaviest wear usually comes on the sleeves of wash dresses. Do not, I beseech you, put big patches on them. The patches, being new, will make all other parts look faded in comparison. Rip out the sleeves and replace with new material of a contrasting color, or match the figure or stripe in plain goods. Add a ruffle of the same goods around the bottom of the skirt if too short, as of course it will be, if its little owner shows the usual capacity of childhood for growth. Children hate patches, and it is cruel to subject them to the unnecessary humiliation of such an open confession of poverty. Really the best way of making little girls' wash-dresses

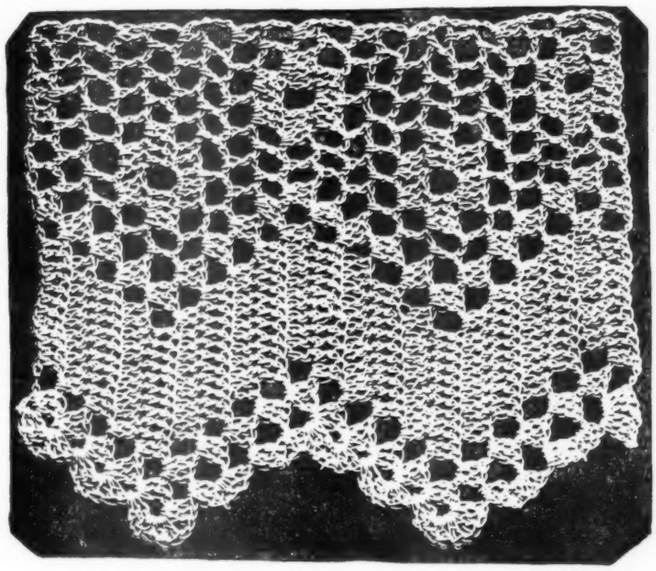
is with a guimpe. If two guimpes are provided for each dress, the dress will wear much longer, as it will not require as many washings as it would otherwise. In providing new dresses for the little ones, consider how to set about the matter economically, selecting serviceable garments. It is not always the best policy to buy goods because they are cheap, neither should one be attracted by the various "novelties" offered, as they seldom wear to good advantage. Flannel blouses in bright tints are pretty and serviceable worn with a dark serge skirt. These blouses are best made in sailor shape and should be rather large in the first instance, to allow for shrinkage in washing.

Handsome Crocheted Lace.

FRANCES H. PERRY.

Chain forty-two stitches, turn.

First row—Treble in eighth stitch, chain two, pass two, treble in each of the next six stitches, chain two, pass two, treble in next, chain two, pass two, treble in next, chain two, pass two, three treble in next, chain two, pass two, treble in each of the next twelve stitches, chain two, pass two, shell in last stitch (three treble, one chain, three treble, make a shell).



BLOSSOM POINT LACE.

Second row—Shell in shell, chain two, two treble over two chain, treble in treble ten times (taking up only the back thread, in every row of this thick work), chain two, three treble over two chain, *chain two, treble over next two chain, repeat from star twice, chain two, treble after third treble, chain two, treble after next three treble, chain two, two treble in last chain, chain four, turn.

Third row—Treble over first two chain, *chain two, treble over next two chain, repeat from star four times, chain two, three treble over next two chain, chain two, pass two treble, treble in each of the next ten treble, two treble over two chain, chain two, shell in shell, turn.

Fourth row—Shell in shell, chain two, two treble over two chain, treble in treble ten times, chain two, three treble over two chain, chain two, treble over next two chain, chain two, three treble over next two chain, three treble over next two chain, *chain two, treble over next two chain, repeat from star three times, treble over same chain as last one, chain four, turn.

Fifth row—Treble over first two chain, chain two, treble over next two chain, chain two, treble over next two chain, chain two, two treble over next two chain, treble in treble twice, chain two, pass two treble, treble in treble twice, two treble over two chain, chain two, treble over next two chain, chain two, three treble over next two chain, chain two, pass two treble, treble in treble ten times, two treble over two chain, chain two, shell in shell, turn.

Sixth row—Shell in shell, chain two, three treble over two chain, chain two, pass two treble, treble in treble ten times, two treble over two chain, chain two, three treble over two chain, chain two, pass two treble, treble in treble twice, two treble over two chain, treble in treble twice, *chain two, treble over next two chain, repeat from star three times, treble in same chain as last one, chain four, turn.

Seventh row—Treble over first two chain, *chain two, treble over next two chain, repeat from star twice, chain two, treble after third treble, chain two, treble over next two chain, chain two, three treble over next two chain, chain two, two treble over next two chain, treble in treble ten times, chain two, three treble over two chain, chain two, three treble over next two chain, turn.

Eighth row—Three treble over two chain, chain two, three treble over next two chain, chain two, pass two treble, treble in treble ten times, two treble over two chain, chain two, three treble over next two chain, *chain two, treble over next two chain, repeat from star five times, treble over same chain as last one, chain four, turn.

Ninth row—Treble over first two chain, chain two, three treble over next two chain, three treble over next two chain, chain two, treble over next two chain, chain two, treble over next two chain, chain two, three treble over next two chain, chain two, two treble over next two chain, treble in treble ten times, chain two, three treble over two chain, chain two, treble over next two chain, chain two, two treble over two chain, chain two, two treble over two chain, chain four, turn.

First row of second point—Treble over two chain, chain two, pass two treble, treble in treble twice, two treble over two chain, treble in treble twice, chain two, treble over two chain, chain two, treble over two chain, chain two, three treble over two chain, chain two, pass two treble, treble in treble ten times, two treble over two chain, chain two, shell over last two chain, turn.

Repeat from second row.

Though this lace is unusually pretty the design is so simple that the illustration will be almost a sufficient guide for experienced workers, the directions being needed only for occasional reference. For the inexperienced, the minute directions guide every stitch of the work. The pattern is appropriate for any crochet material. In cream or gray linen it forms a very effective trimming for curtains or draperies. In silk or fine wool the ribs in the thick border are quite conspicuous. One trial of this pattern will be followed by another, for it is one you will not tire of looking at, as the pattern is small and artistic. Crocheted lace of this Blossom Point and similar designs can be used for many purposes, and has the charm of hand-made work.

Portieres.

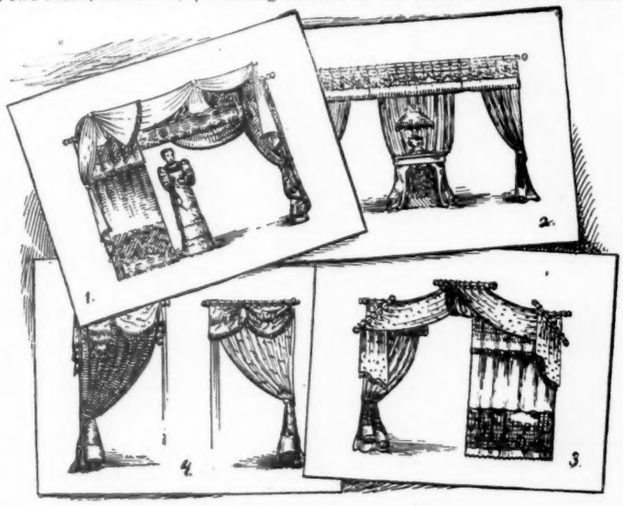
No modern home seems complete without some display of portieres to relieve the monotony of the walls and the angular door frames. So much depends upon these that all city houses have provision made in the construction for curtained nooks, recesses and alcoves, while wide, folding doors exist wherever convenience will permit, and over these decorators use great ingenuity and taste in arranging draperies.

The prevailing custom seems to demand a freedom and irregularity of treatment rather than the severe symmetry so generally studied in past years. Light scarf draperies, freely disposed above heavy curtains of a harmonious color, give a more pleasing effect than the old lambrequin; the sketches given may be suggestive to some home decorator. Sketch 1 gives an arrangement of two heavy curtains hanging from a long pole; one side is folded down at the top, and the other, after allowing a scant display at the top, has the rest of its folds draped back at the side. Two lengths of scarf drapery are placed above; this would make a narrow door opening seem more spacious if the straight curtain is allowed to cover a blank wall. Sketch 2 is a simple disposition of three heavy curtains joined at the top—this is adapted to use where there are two single doors adjoining. Sketch 3 is applicable where sketch 1 can be used, and requires three short poles for the scarf. Sketch 4 gives two ways of draping a single curtain—one with a scarf drapery above, the other with a folded end depending from a pole.

A Stamp Table.

MARGARET NOURSE.

In a little village in my neighborhood every letter, paper and package that comes to town is quickly despoiled of its stamps, for the collectors are all busy making stamp tables. This is the way they do it. Stamps of every sort, Columbian ones and twos, particularly the former, the old-fashioned red stamps and their many-colored brethren all are brought together and the little white margin of paper around them is carefully trimmed off. Then, if necessary, the stamps are soaked in water to remove any superfluous paper. The table whose surface is to be ornamented may be of any sort whatever, and no especial preparation is necessary before applying the stamps, except that it should be clean and smooth. A section of the table, say a quarter or less, if the table be large, is covered over with a good coating of photographer's paste or mucilage, and having arranged the stamps in piles, they are applied in irregular fashion, not putting many of a color together, and by preference using red, instead of blue against heliotrope. The black markings of the postal clerk add to the richness of the effect. The remaining sections of the table are finished in the same manner, but the edges of the table are not covered. When the surface is thoroughly dry, which may be in a day or two, a light coat of thin white varnish is carefully applied, and the result is an interesting and unique piece of furniture, whose value will increase as the years go on. Of



TASTEFUL ARRANGEMENT OF PORTIERES.

course a variety of foreign stamps adds to the interest of the collection, and the stamps on an official envelope may be used, though their shape is somewhat difficult to treat. The effect of the surface is that of a handsome mosaic.

A Reigning Favorite.

To be in style one must have, for street wear, a long scarf to tie in an enormous but becoming bow beneath the chin. It must be of soft web silk or satin in any one of the numerous beautiful weaves, or of broad sash ribbon, and it must be trimmed across the ends with a frill of broad, handsome lace, or all around the ends with a frill of narrower lace. The ends may be cut straight across, or slanted to a point at one side, but both must be finished alike. If of soft, uncrushable material, the scarf is carried about the neck to form the collar, but if of more unmanageable material, a stock collar is made of the same, and the bow is permanently attached to it. Our sketch shows a reigning favorite. It is of soft black silk—two and a quarter yards long, and fourteen inches wide—and is trimmed with broad, white lace. The loops are drawn out at least to the shoulder seams and the ends flow freely. Such scarfs are worn with coats, jackets and capes of all lengths—as well as with all sorts of street suits. Occasionally one matches a suit, and occasionally the slanted ends reach only to the belt; but the favorite seems to be broad and long, all black, or black and white, or black and ecru.

STYLISH SCARF.

A Pretty Model for Any Material.

Here we have a pretty blous suitable for all seasons. It is made of red India silk, over a fitted body lining, and is gathered slightly, front and back, at the neck and waist. The sleeves, very wide at the top and close below the elbow, have only one seam. The bertha frill, cut straightway

TASTEFUL BLOUSE.

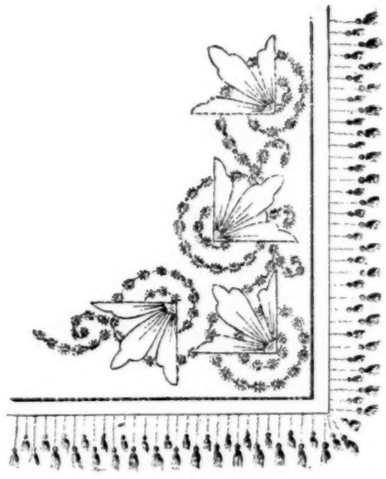
of the cloth, is smoothly applied across the back, the same as in front, and is full over the shoulders. Three rows of narrowest black silk gimp forms the neat but effective trimming. Very narrow ribbon is sometimes used instead of the gimp; then the collar and belt are fastened under full rosettes of the same. The blouse skirt is sometimes detachable—being secured only to the belt, a convenient arrangement for those who are "making over" the goods.

June Grasses.

Many kinds of grasses reach their greatest beauty in June, when the prettiest specimens should be gathered, and crystallized for winter decoration. The process is a very simple one and may be continued throughout the summer and fall. Take a large earthen pitcher and make a solution of one pound of alum to a quart of slightly warmed water. Tie the clusters of grasses, which must previously have been well dried, to a stick which can be placed across the top of the jar and leave the grasses submerged for twelve hours. Remove them and hang up to dry and, if not sufficiently crystallized, repeat the operation a second or a third time. You may produce beautiful effects by coloring the water with indigo, Venetian red, or saffron tea. Lay away in stout pasteboard boxes until wanted for use, to keep them free from dust. They make very effective decorations for the Christmas tree.

Rococo Embroidery.

Many fancy braids are being introduced for this novel embroidery, but the medallion and serpentine braids are always well adapted to the work. The material used is generally denim, duck or linen, something with a "body" to it being better for the purpose. The design must be a very open



ARTISTIC TABLE COVER.

one, in order to be effective. The braid is first basted down, and then sewed firmly. For very handsome work, the picot edges of the braid are caught down with fancy stitches, done in contrasting silk; in the case of serpentine braids, the points are caught down with long, ray-like stitches. The designs for rococo embroidery always include a figure to be done in solid or outline embroidery. The corner of the table cover shown here, is made of old-rose jean, the braid caught down with silk several shades lighter, and the figure outlined with silk of a contrasting color.

Money Making for Girls.

VELMA CALDWELL MELVILLE.

Girls like to have remunerative occupation as well as any one else, and this is as it should be. The time has come when independence is a marked characteristic of the civilized world. In the first place, if a girl has decided talent in any particular direction, and her parents are wise enough and "forehanded" enough to cultivate it, she is already provided for; we are not talking to her or to any one who is situated to prepare herself for wage earning; we are only talking to the average young girl on the farm or in the village. What some are doing, others may do, so we cite instances by way of illustration.

In a small village, not a thousand miles from the home of the writer, there exists a solitary restaurant. A young girl of the village has a decided bent for cooking and baking. One day she asked the restaurant keeper if he would give her an order. Very gladly he complied. The orders are regular now; not large ones, of course, and every Saturday she delivers at his counter a certain number of pies, cream puffs, cookies, and last, but not least, baked beans and brown bread. This young girl's father is well-to-do; she has no need to earn money now, but who knows what the development of this talent may be to her some time, while, of course, now, the money she earns is worth a great many more cents on the dollar than what her father has always freely given her. Then, too, she is developing business

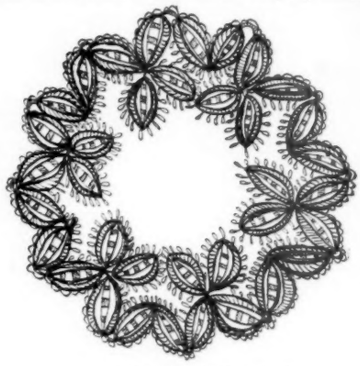


FIG. 1. SIMPLE STYLE LACE.

faculty and observation. She figures closely in order that she may know just how much she clears, and to this end can tell exactly what a cup of flour, or a teaspoonful of baking powder costs.

All girls may not have a talent for cookery, but all may become good cooks, nevertheless; and, in these days of woman's exchanges, lunch counters, restaurants, and the like, a good cook can be sure of ready sales for her wares.

Honiton Lace Work.

"Ideal Honiton" is the name given to the style of work now most popular for table and bureau decorations. Plate and cake doilies, tray cloths, center pieces, mats and bureau covers are all fashioned of the Honiton lace braid applied to linen or bolting cloth, and embroidered with silk, linen floss or the finer nun's thread. The braid comes in various styles and widths; stamped and basted patterns may be purchased at art stores. It is very simple and much less expensive, however, to lay out a design for oneself, a little practice soon making one quite expert. For the small doilies here given, a yard and a half of braid and three skeins of embroidery silk are about the quantity required. The design may be drawn upon the linen, or the braid basted in place by the eye, while it is advisable also to sew down the edges to prevent slipping, though great care should be taken not to get it too tight. In the simplest style (Fig. 1), the braid is buttonholed all around with white Japan silk (number 691), the outer row forming a scallop, and then cut out with a sharp pair of scissors, leaving the openwork as though set in the linen. In the more elaborate doily (Fig. 2), the buttonholing is on the inside only, while the squares formed by the

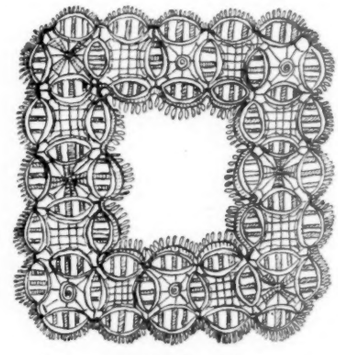


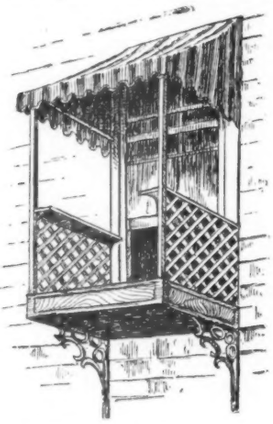
FIG. 2. ELABORATE STYLE DOILY.

braid are filled in with lace stitches, known to all skilled needle women as "the star, the cross, the penny, the button, the window-pane," etc. Indeed, any pretty fancy stitch may be employed. Lastly, the fabric is all cut away from beneath the lace work and the outer edge finished by a narrow purling that comes for the purpose.

An Outdoor Window Garden.

Window boxes, plant stands, and shelves are the resorts, during the winter, of the lover of flowers whose purse does not permit a greenhouse or conservatory, and, when summer comes, one's bright-

hued pets can usually be given a home in an open-air flower-bed, but this is not always possible. Some flower lovers live in city homes, in "flats," or in other quarters where garden space is not at hand. Even under such conditions an outdoor garden is not one of the impossibilities. A window box for plants may be hung outside one's window as well as within, and in the illustration accompanying this, is suggested a way by which a considerable bit of gardening may be done outside a single window ledge. A rectangular window box is supported on stout iron brackets; from its two outer corners arise two light posts of inch and a half stuff, which connect above with a wooden framework, over which is spread awning cloth. Such a framework is very easily made of laths and can readily be screwed to the window casing. A little way up from the box are placed narrow shelves, one on either side, to hold light pots of plants. The space below on the sides can be



DESIGN FOR A CITY GARDEN.

made attractive with lattice work, or left open as one may prefer. A very pretty effect will be produced if wire netting be spread over the frame above the lattice work, and climbing plants trained over it. Such plants may grow in pots upon the shelves, or in the soil within the window box. Every part of this arrangement is accessible from the open window, and the flowers that may be cultivated within it will pay large interest on the small cost of such a window-garden.

Pretty Toilet Cushion.

D. HAMILTON.

The accompanying illustrations show a very dainty toilet cushion and a very useful one, too, inasmuch as its top and bottom covers are easily removed for washing.

The finest of white butcher's linen is chosen for the covers, and surah silk for the puffed edge. Two round pieces of the linen are cut of the desired size, as shown in Fig. 1, and a conventional design, worked upon one of them, in pink "wash silk." Then the edges of both rounds are sharply pointed and the points worked about with the pink embroidery silk, in buttonhole stitch. In each point small holes are cut and neatly worked. Now the covers are ready. The cushion itself is supposed to be all prepared, stuffed with something light and fine, and with a bit of sachet powder sprinkled in for fragrance. A long strip of delicate pink surah silk is fulled about the edge of the cushion, above and below. It must be full enough to puff out prettily, and must be fastened well in beyond the point where the cover will come, to avoid any showing of raw edges. Then the covers are adjusted and white "baby ribbon" laced in and out of the eyelet holes in the points to keep them adjusted. The ribbon ties carelessly where the ends meet. The pink puffing will require a little manipulation before it will look its prettiest,—the soft silk escaping through the lacings in graceful little puffs.

FIG. 1. TOP OF CUSHION.

Whenever the covers are soiled they can be removed and laundered, and soon laced back into

FIG. 2. TOILET CUSHION COMPLETE.

place again, Fig. 2. One can hardly imagine how delicate and lovely the cushion is till one sees it completed and placed upon a toilet table whose other belongings harmonize with it. When finished, it will measure about eight inches in diameter.

Work for the Artistic Shopping Book.

F. P. SCRIBBLER.

The design for a shopping book, shown in our sketch, is so odd and original it will please artistic gift-makers, in search of novel ideas in fancy work. It is a blank note book, with detachable leaves, for the daily use of those who often "a-shopping go." Buy a small uncovered blank book with perforated leaves, or make one of good note paper, making the perforations with a sewing machine, and cut or pierce four holes through the fold at the back. Make the cover of cream-tinted water-color paper, a little larger than the inner leaves. Notch the edges, and decorate with a quarter-inch band of bronze gold. Do the lettering with bronze gold touched up with deep red or green; the figure, a lady with a shopping bag and a leaf from the note book, may be outlined with the same, or painted in natural colors. On the back cover, or on an inner fly-leaf, write or print with colors, or with pen and ink, the following lines:

O, when my lady shopping goes
—In June or in December—
O, scores of things are on her mind,
Impossible to remember.

But if she'll come to me each day
—With pencil and persistence—
Then take a leaf in her shopping bag,
She'll find me of great assistance.

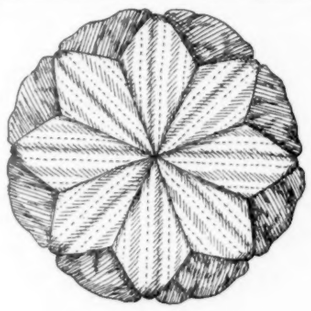
And when I'm thin and leafless grown
—If she finds me nice and handy—
She'll add new leaves—
or she'll all forget
—But ribbons—
and lace—
and candy.

Makes holes in the back fold of the cover, to match those in the book, and bind the two together with narrow ribbon; then tie the ends, as shown in the engraving, to form a loop by which the book may be suspended, where it may be handily reached at any time. As the verses plainly indicate, all one has to do when starting out on a shopping tour, is to remove and take for reference the detachable leaf, on which has been noted, from time to time, a list of the different articles needed.

Less elaborate but very pretty covers might be made of parchment paper, celluloid, or cardboard in fancy colors, with only the border and lettering for decoration. Or, simpler still, the cover might be labeled "Shopping-Book," in large, fancy letters, and be artistically splashed with the bronze gold over a part of the surface.

Columbian Cushion.

Here we have a new and pretty design for the ever-welcome and comfortable cushion; it is suitable alike for indoor use or for the hammock, lawn chair or piazza couch. It is of the national colors, as its name indicates, blue and white fancy striped ticking and rich red sateen. It is round and twenty-two inches in diameter; a puff of the sateen covers the edge, and is gathered and drawn in almost to the center, on both sides, where it is securely tacked to the cushion. A star shaped cover, made of the ticking, is fitted over each side (the center of each star being tacked to the center of the cushion), the points are drawn closely over the edge, and the tips of each corresponding pair



COLUMBIAN CUSHION.

are tacked together. If desired, the stars may be bound with blue, and the points buttoned together with small blue covered buttons. Each section for the stars should be cut only ten inches in length, so as to fit snugly over the puffed edge, as shown by the sketch. Such cushions are bright, handsome and durable, and are not easily soiled—just what is needed for every-day comfort in rural homes.

Baby's Best Gown.

This quaint little gown is of pink taffeta trimmed with black velvet ribbon and cream lace edging. The full waist is puffed over a very short-waisted lining, to the bottom of which is sewed the full, gathered skirt. Drooping puffs cover the top of the plain coat sleeves. The sketch shows the arrangement of the lace and ribbon decorations. The two ends of each ribbon band—except those about the sleeves—are tied together in charming little bows, which add much to the dressy effect of the gown. Pale blue crepon, with white lace and satin ribbon, would be lovely for a gown in this style—though the design would develop prettily in any soft fabric, and could be made appropriate for any season.

PINK TAFFETA GOWN.

Homemade Cabinet for Bric-a-Brac.

ELLA ROCKWOOD.

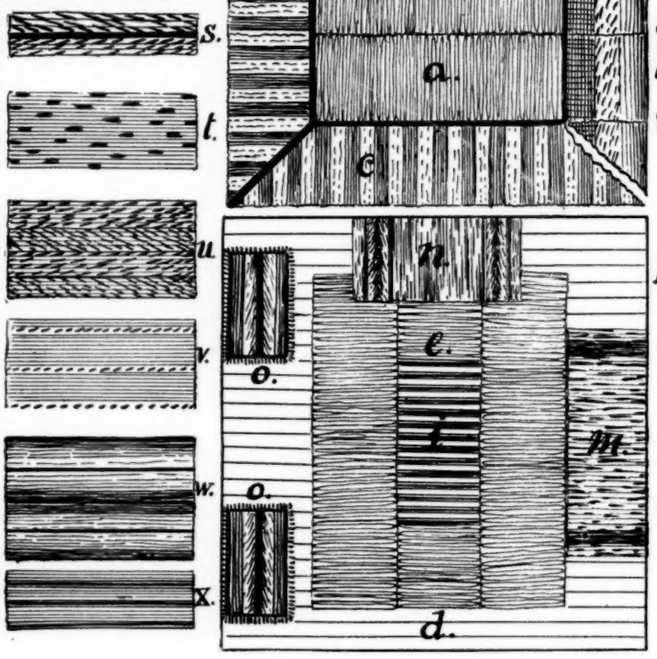
Procure from a dry-goods store two thin boards such as silk dress goods are wound on. Rub them with fine sandpaper until perfectly smooth. Take four spindles from an old-fashioned chair back or bedstead, or lacking these, four smooth, round hoop-sticks, about half an inch in diameter and twelve inches long, and treat them in the

same way. Bore holes in each corner of the boards and insert the sticks, gluing them to make them fast. A small nail may also be driven in each stick from the edge of the board where it will not show very plainly. Give it two good coats of white enamel paint, or common white paint, and a coat of varnish. Fasten to the wall by two ring-head screws in the top shelf and you have a very pretty little cabinet for choice china or bits of bric-a-brac. A silk curtain, of a color to harmonize with the room, may be hung on a brass rod from the top shelf if desired, and adds a bit of brightness to it, which is very effective. Such inexpensive ornaments do much to add to the coziness of the room, and may be constructed by almost any one.

Artistic Rag Carpets.

There are many ways of using time to greater advantage in these days than in making rag carpets, still there are those by many a farmer's fireside, upon whom the weight of years or infirmity has fallen, whose weary hours are made brighter by some light employment, and who are more contented if useful in the household economy. The preparation of the materials for a substantial carpet will be a pleasure to such, while the weaving will be a boon to some neighbor who still retains the nearly lost art of using the old hand loom in weaving carpets.

The thickness of the cloth must guage the width of the strip, so that the carpet will be even in its weaving throughout; the heavy goods being cut narrow and sewed flat when overlapped, as at *p*, and the thin goods being cut wider, and folded and sewed more like the piece shown at *q*. The rag carpets of our grandmothers were too often a gorgeous collection of inharmonious shades and vivid, contrasting colors, which were usually combined into broad stripes of such wonderful arrangement that instead of being a welcome background to the cheerful features of the room, its long, brilliant-hued bands would put to shame the modest, homely furniture. Modern ideas do not favor this kind of display; a modest harmony of tints is everywhere seen in the best carpets, affording a good setting for the other furnishings. Many rooms are improved in every way by having a large central rug, and leaving the bare, well-oiled floor as a margin to the room. Can these more artistic requirements of present custom be brought out in home manufacture? The suggestions in the sketches may assist in such an effort.



NEW DESIGNS FOR RAG CARPETS.

In the illustration, *a* represents the center of a large rug, in size 12x15 feet; this center is formed of two breadths of some plain, brownish tints, such as one's material may suggest; these two middle breadths extend out at either end so as to form sections of the border, *b*, which is a yard wide and of some broad, fancy stripe. Three yards of similar border finish off each side, and the corners are formed of squares cut diagonally and the pieces joined flat, as at *g*, with a wide band of felt or flannel of some good, solid color to cover the seam and form a panel around the center. One-half of this border is replaced by a striped design, as shown at *c*, giving a simpler way of producing a border effect.

Another plan for a large rug is shown by the corner of plain border, *k*, running around a center formed of alternate squares of a narrow striped design; every other yard of the carpet having the stripes reversed, one being dark with a light stripe and the next light with a dark stripe. Design *r* is a more difficult corner to make, but easily understood. At *d* is shown a plain floor covered with a central rug and some mats along the sides, at the mantel, the sofa or the doors, as the room requires; the central rug may be of "hit or miss," in pale greenish tints, with the middle enlivened by some narrow stripes, in which a few harmonious, brighter colors relieve the sameness.

The hearth rug, *n*, may be of "hit or miss," in shades of red and black, with a feather stripe of the same colors at either end; *m* can be woven of cream and browns, in "hit or miss" style, with a solid border in dull red. The door rugs, *o*, *o*, may be of brighter and more contrasting colors, and may have a fringe sewed on all around.

A so-called feather stripe, *s*, is formed by twisting two colored strands together; the threads for one side of the stripe being twisted in one direction, and those for the other side the opposite way; this is done on an old-fashioned spinning wheel, and when the threads combine well, it produces a pretty effect. A carpet made of all twisted goods regularly reversed, as at *u*, would be very pretty in light and dark shades of brown. *V* is a single twisted thread of blue and white in a ground of gray; a black ground with an occasional dash of red in "hit or miss" effect, as at *t*, would be simple and rich in its appearance. Shaded wood colors and black form a neat combination, as at *w*, if the stripes are not too wide; *x* is a plain, narrow striped design, effective in dark wine color and olive, or in blue and golden browns. Any garment which has been pleasing in itself, will generally combine agreeably with some other material at hand, so that the distasteful work of dyeing can be dispensed with; especially when it is the rule to preserve harmony in tone, rather than attempt to outdo the rainbow in some unnatural combinations of gaudy colors.

Homemade Lapboard.

E. E. SAGE.

Living so far out in the country, one learns to depend more or less on his own resources for conveniences about the house. I never had a cutting table or lapboard, though both have long been in market. But I made my own, which has been a great convenience to me. By taking a couple of smooth pine boards three-fourths or one inch in thickness, placing them together and dove-tailing the ends, you can make it the length and width you wish. However, mine is 20x30 inches. Then for legs take strips of scantling the height of your sewing chair, crossing them a little nearer the top than the bottom, and fastening them together; screw to top edge of board, with T hinges or butts. When this rests on your lap, you can, with your foot, reach the legs and regulate the slant of your table to suit your work. If you are called to leave your work, the front edge can rest on the back of the chair, making a flat top table. When through with it, by dropping the leaf against the legs, it can stand, face to the wall, thus out of the way. Mine, also, has a pincushion tacked to the right hand corner, and several long wrought nails for holding spools of basting cotton. On the side edge are some brass hooks, on which I hang shears and work-bag.

"S'prises."

ANNIE HAMILTON DONNELL.

I think it is Jim Fenton in Mr. Holland's "Seven Oaks" who is always signing his "Alfred David" in matters of import, where his opinions are not emphatic enough of themselves. If I were asked to sign my affidavit as to what was the best panacea in the market for humanity of very tender years, suffering with baby ennui, I should pass over all the sarsaparillas and emulsions and tonics and, in the calm strength of my convictions, write my name under the words—"A Surprise! A really, truly, sudden, little "S'prise!" It is the magic key that unlocks the door to infinite delight and comfort. What mother has tried it in vain? But I wonder if all the mothers have tried it, and know from experience its success as a medicine? The happiest little folks in christendom have their uneasy seasons when all the dollies are deserted and the world looks wofully dull and out of joint. They will have none of stories even, if they are well advanced in ennui-ism, and mother wits are sorely tried to find the bit of spice their fastidious little tastes demand. Try my patent medicine. Prepare a simple little "exprisement," as one small lady calls it, and see how quickly the world gets bright again and the dollies come out of their banishment. I will cite one instance from real life and the thousand and one other surprises equally as effective will suggest themselves, with no need of introductions. Let it be supposed that a bit of a woman of four "or so" has been attacked with the malady mentioned above, and is looking at the world through very blue spectacles indeed. Her mother slips out of the room and comes back in a trice with—O, such a beautiful "s'prise"! Presto! the blue spectacles are off, and the sun is shining out of the eyes that wore them a minute ago. The little doll's table covered with a towel or napkin and "set" with the dollie dishes, the same as grown-up dinner tables, with a plate of tiny squares of bread and another of infinitesimal pieces of sponge cake or gingerbread, and maybe—crowning joy of all!—a wee pat of butter and a wee saucer of shining jelly! Sugar bowl filled with sugar and just a drop or two of milk—or, anyway, water to *pour out* for tea. That's the surprise. It is very soon prepared, but it will last a long time. I knew a little maiden once who was surprised in just that fashion, and I was an eye-witness to the eagerness with which she took the medicine and its "sure cure." The dollies were instantly bidden to a "party," that never-failing delight of babies and dollies.

Perhaps the surprise might be a new family of paper dolls cut out of bright paper and introduced suddenly; or it might be the rare privilege of playing with the "sick playthings"—the special

dolls or toys reserved for indisposed little men and maidens. Almost as effective may be letting the little ones "s'prise" somebody else. They will work away very busily and happily, always with the greatest secrecy, and when the intense moment of denouement arrives, let there be no lack of amazement and delight. The greater the surprise the better, of course. And, by the way, have you ever noticed how speedily and beautifully the playthings are cleared up at night, when it is done to "s'prise papa" when he gets home? That is worth trying, too. So many things are worth trying that will bridge over the stubbly places in the little paths and make them as smooth as possible. By and by will be soon enough for the "thank-you-ma'ams" and jolts.

And, after all, this delight in "s'prises" must be hereditary, I think. Who is too grown-up not to like the pleasures all the better when they come upon us unexpectedly?

Wash Dresses and Shirt Waists.

It is the experience of most women that summer gowns last a very long time. One warm season is so short that extremely thin frocks generally remain over from year to year, becoming hopelessly old-fashioned long before they are worn out. It is pleasant, then, for the economist to read that none of the fabrics in vogue twelve months ago are at all passé this season, and that, as the tendency is toward greater simplicity, it is quite easy to remodel old costumes and make them both pretty and stylish. In doing this, the overskirt is often helpful, though, to be candid, it has not taken the popular fancy so quickly as was anticipated, and among the new importations, only about one dress out of four has the upper drapery. A concession in the overskirt directions, however, may be observed in the panels inserted in the sides or front of many skirts, either of a contrasting material, or of some rich, wide trimming.

As a rule, the attractiveness of print gowns lies in being dainty and cool looking, and, therefore, those designed for morning wear, are made up quite plainly. Scotch ginghams, light weight zephyrs, chambrey, Madras, and other soft finished cottons, are usually chosen with figures, stripes or dots of color on a light ground, plaids being now considered past style. Ruffles, insertions and edgings of white embroidery in rather open patterns, are the favored garniture, while a dressy finish is often given by a stock collar, belt, bow and sash ends of satin or moiré ribbon, either black or matching the design in color.

One of the most simple and best liked models for a gingham or sateen morning gown is known as the "housemaid frock." The belted bodice is unlined, and has seams only on the shoulders and under the arms. It is gathered at the throat and at the waist line, both back and front, and extends several inches inside the skirt. The collar band is so high as to require two buttons to fasten it, and to this is attached a turnover collar of white embroidery. The sleeves are the popular gigots, finished at the wrists by narrow cuffs matching the collar. The skirt, from three to four yards in width, is gored in front and on the sides, but hangs straight in the back. The foot is deeply hemmed, and the top is gathered to a belt, which goes over the round waist and is concealed by a crush girdle of satin, or a ribbon ending in a bow, and long ends which fall to the bottom of the skirt. If, too, more trimming be desired, three crosswise insertions of embroidery may be applied to simulate a yoke, or a shaped bertha of the gingham bordered with white edging. The very expensive ginghams that have crêpe-like surfaces or are dotted with silk, are handsome enough for lawn parties and quite nice wear, so are fashioned much more elaborately with accordion pleated skirts, and a lined and boned waist to which a bodice of white, écru, or the new butter-colored lace is added. This bodice is gathered to the lower edge of the waist, extends up on the bust and hooks under the left arm. Lace frills at the wrists and epaulettes on the shoulders trim the full sleeves, while blue, pink, green or any preferred shade of velvet, forms a belt and a stock collar closing in two tiny ruffles at the back.

The duck outing suits so popular last summer are again in vogue, but divide favor with those of linen, of the cotton goods known as Galatea twill, and, most modish of all, those of wide ribbed piqué, which comes in stripes and in delicate tints of rose, yellow and robin-egg blue, as well as white. These are tailor-made, with short coats having straight, open fronts, revers, and closely fitting back, very full below the waist line. The skirt clears the ground, is sharply gored on the front and sides, and is laid in godet pleats in the back. With this costume, of course, a shirt waist or a vest is necessary, and very chic ties are now sold to accompany these, fashioned of knife-pleated linen or percale, closed by a square bow of tightly strapped loops without ends.

The écru shades, sometimes called "linen color," are particularly fancied this season for shirt waists, whether of pongee silk, Madras gingham or linen batiste; although as usual many of striped and dotted cheviot and percale are, likewise, seen. The newest are cut very much like the housemaid bodice described above, but have a pointed yoke neatly stitched, and bishop's sleeves in place of the mutton-leg. The latter are nearly a yard wide and are gathered into straight cuffs four inches deep. The collar, whether standing or turnover, is always exceedingly high, and fastened by two, and sometimes even three, buttons or studs.

The mulls and muslins are so charming with their filmy garnitures of lace, that we cannot help hoping many of our "sweet June graduates" will select them for commencement day, in place of silk or satin, as well as those bright girls who have passed their school days, but want a new white gown. The sheer organdies and pin-dotted mulls are particularly pretty and satisfactory, and always becoming. The waist should be finely tucked in perpendicular tucks from the bust to the belt and left full above, while a collarette of Valenciennes, or one of the fine French laces, trims it beautifully, and, if liked, a fall of the same may also be added below the round waist to form a basque or volant. The sleeves match, being tucked below and full above, with a ruffle of lace at the elbow; and insertions of lace are set in the skirt above the hem and around the hips. Completed by a belt, sash and collar of white satin or moiré ribbon, white shoes, stockings, and gloves, this will form an ideal girlish costume.

Reforming an Entry.

CLIFTON S. WADY.

The reader probably knows of more than one farmhouse which does not boast of a hall or "entry" at all, and of those so supplied, there is generally small occasion for boasting. This was true of our own, and I wish to describe how I rendered it cosy and attractive at small outlay. The hall, being the first room a visitor enters and the last which he leaves, should be bright and well appointed—not less so, at least, than other rooms in the house, yet, oddly enough, it is neglected more than any other space in the home.

Ours was small, with painted walls. These latter I sized with weak glue, and later covered with plain "cartridge" paper, so called. It is cheap, does not show dust, and is easily put on to look well, as there is no "matching" of design. Avoid blue tints. Some warm tint of red, tan, brown, or the like, is brighter. I pulled out the apology for a hat-rack, which was on the wall, and sent to one of the big New York department stores, which advertise to sell goods from catalogue, for a pretty rack. It afforded ample room for our purposes, and had a heavy plate mirror in the center, with coat and hat hooks on the sides. It cost $5.50. Beneath this I stood a "shoe box," which I had made from a large soap box. As this appears to be a very useful and not common adjunct to the hall, I will describe it. Put in two or more heavy partitions nailed in place by driving the nails through front and back of box. Cover the box with red figured cretonne and fasten on the cover with hinges, padding the top, which makes a convenient low seat for putting on and removing overshoes. Inside this cover I tacked a strip of leather to hold a whisk broom, and a bag for driving gloves or any bulky article for out-of-door use. Make the cover of a piece of wood sufficiently heavy to bear one's weight, and get the cretonne covering for box in one long piece. Tacking one end of this to the back of box, it may then be brought around completely and tacked to the back again, thus presenting an unbroken surface. The top and bottom edges are to be turned in and tacked out of sight. Do this before putting on the cover.

Now place on the floor a bright rug to match the prevailing color, tack a slender gilt molding about the wall, from nine to eighteen inches from the ceiling, to simulate a frieze, and I think you will agree with me that a few dollars could not be better invested than in the direction I here note. If one has an old-fashioned, long mirror lying upstairs, it may be reframed or the present frame stained, and put against the wall lengthwise, over a strip of wood similarly treated, containing coat hooks. A bright carpet remnant on the floor, and the walls neatly papered, will produce a wonderfully improved effect at a very slight cost.

June Delicacies.

Fontenelle ascribed his longevity to strawberries, averring that they cooled a fever which attacked him regularly every year, just previous to the berry season. He used to say "If I can but reach the season of strawberries." Different authorities ascribe to them curative powers in cases of gout and consumption; nevertheless, there are some persons with whom they disagree in their raw state. Such persons will find the fruit, if simply stewed, very wholesome, but there are also many desserts with which one can vary the monotony of the plain stewed fruit.

Strawberry and Custard Pudding.—Put four tablespoonfuls of freshly made strawberry jam, made by cooking a pint of berries for twenty minutes with half a pint of sugar, into a baking dish; cover with four ounces of bread crumbs and pour over gradually a pint of custard made with a pint of milk, two eggs, and two tablespoonfuls of sugar; pour this on gradually so that the crumbs may absorb it and bake half an hour in a moderately heated oven.

Strawberry Blancmange.—Make a quart of ordinary blancmange colored with the juice drawn from a quart of fresh berries. To do this, eight hours before it is wanted, put the berries on a flat dish sprinkled with six tablespoonfuls of powdered sugar. Use the syrup which flows from them. The berries may be piled at the base of the blancmange or they may be used for stewing, and fresh berries piled about the pudding. Fresh, sweetened or whipped cream is delicious with this handsome dessert.

Strawberry Cheesecakes.—Bruise a pint of berries with a wooden spoon in a china bowl; add four heaped tablespoonfuls of powdered sugar and eight well-whipped eggs. Line some patty pans with good paste, fill three parts with this mixture and bake in a well heated oven.

Strawberry Soufflé.—Put a quart of berries over the fire with four ounces of sugar and half a pint of water; when the fruit is soft take from the fire and press through a sieve; rub four ounces of flour smoothly with half a pint of cream, having previously rubbed butter, the size of an egg, well into the flour; put this with the fruit, return all to the fire, and when it begins to boil add first the beaten yolks of six eggs and next the whites whipped to a stiff froth. Fill the soufflé mold at once and bake in a moderate oven.

Strawberry Cake.—This is not exactly a strawberry shortcake although it serves the same purpose, and is a most tempting dessert. Make a cake dough, as simple or as rich as you please; using small pans, put in enough of the dough to make a thin layer at the bottom; put in this dough, points down, as many small sized berries as you can, not allowing them to touch each other; drop a little powdered sugar on each berry and cover with another layer of dough; bake in a moderate oven and, when almost done, cover all over with a very stiff frosting; set in this, large, not overripe berries, and return to the oven for five minutes. Eat cold with whipped or sweetened cream.

Strawberry Cream.—Sugar a quart of berries, using a cup of powdered sugar, and set away for an hour or two; mash through a fine sieve; melt over the fire half an ounce of gelatin, which has soaked for half an hour in barely enough strawberry juice to cover it; add two tablespoonfuls of sugar, the juice of half a lemon and pour through the sieve into the bowl of berries; beat thoroughly; add a pint of whipped cream, mix lightly through and pour into a mold. Set on the ice until thoroughly chilled. Serve with or without cream.

Canned Fruit.— Many housekeepers complain that their canned berries do not retain either their flavor or color. If only the finest and most freshly gathered fruit is used, this will not be so.

His Name or His Character?

SARA H. HENTON.

My name is Lucky Landreth. My father was christened Ichabod, but his disposition gained for him the nickname of "Happy." He was farmer, mechanic, horse-doctor, hunter, or fisherman, as the occasion called for, but I doubt if he could have been a success at any of them. He and my mother found it difficult to "make both ends meet," but they always seemed to accept pecuniary reverses with the same easy indifference as they did success. When I came into the world there were already three boys and three girls to feed and clothe, and though my parents were pleased at my coming, the neighbors looked upon it as a calamity.

This is the way I came to be called "Lucky:" A kind neighbor, who had lost her darling boy only a few weeks previous to my birth, gave his wardrobe to my mother. The outfit was finer than anything my brothers or sisters had worn, and such as my parents could not have afforded for me. Hence my name. As I grew older, also, I was the recipient of a quantity of clothing from mothers whose children had outgrown the same. In my sixth year my mother was taken ill with fever, and the four younger children and myself were distributed around among our friends, leaving my older brother and sister at home, to assist in the household duties. I was taken by the teacher of the infant Sunday-school class, Mrs. Hamilton, with whom I had been a great favorite. Her family was the wealthiest in the town, and she had three daughters, having lost her only son, of six years, whose clothes I had fallen heir to. I well remember my entrance to their home. The large rooms, elegant furniture, and beautiful paintings were beyond anything I had ever seen. I had heard so much at home about the goodness of God and mansions in Heaven, that I thought this family must be of the chosen ones. At tea, my first meal with them, the dining room was brilliantly lighted, and the china, napery and silver looked gorgeous to my eyes. We had but little silver at home and common china, and only used linen tablecloths when we had company. Mrs. Hamilton placed me near her. I took my seat with a feeling of awe and reverence, and bowed my head, expecting the blessing. Mr. Hamilton asked me if I would have some meat.

"You have not asked the blessing yet," I said.

"We do not ask blessings here," said the youngest child.

I immediately burst out crying and left the table, and soon Mrs. Hamilton followed me, and said:

"What is the matter, dear child?"

"O," I replied, "you have such a pretty table and such nice things to eat, and not ask a blessing!"

Mrs. Hamilton took me by the hand and said, "Come back with me, child, and I will ask the blessing." And she did so.

At bedtime we were taken to the nursery, and each one of us laid our head in Mrs. Hamilton's lap and said our prayers. I dreamed fairy dreams. Much to the children's surprise, Mrs. Hamilton asked the blessing the next morning at breakfast, which raised me very much in their estimation. Bessie was nine years of age and the eldest, and thought she should be obeyed by her younger sisters. Sallie, the second, was seven, and Carrie, the baby, four. I soon learned to like Sallie, and we would often wander off by ourselves, to have a quiet play together. She was her father's favorite, and, if the weather permitted, always met him at the gate. I learned to be fond of Mr. Hamilton, and was never so happy as when listening to his stories about bears and other animals. I found out when it was best to approach him, and never worried him when I saw him look tired, or when he was reading; and when Sallie and I were allowed to go to his office with him, our cup was filled to the brim with joy.

It was time for schools to open, and my brothers and sisters all went to the public schools. Bessie and Sallie Hamilton attended a private school, and when they started, leaving me alone at home, I was quite homesick. The next day Sallie persuaded her father to let me go along with them, and my lunch was put up with theirs. The people in the town said: "Just think of that Lucky Landreth going to a private school. He will get everything he wants in this world, and you will all live to see it. He was born to good luck."

When my mother was better and I had been home a few days, Mr. Hamilton came over to see me, and while there offered to educate and clothe me—an offer which my parents thankfully accepted. I was to spend every Saturday with the Hamiltons. When told of the arrangement made, I could not sleep for joy.

My highest ambition now was to be in Sallie's classes. My teacher said if I studied hard I might catch up with her. I had to be made to go to bed, and Sallie would help me with my lessons. While I was not a prodigy, I possessed a good share of common sense, which, with habits of close appplication, will always bring good results. I felt kindly toward every one, and I was a favorite in the village. The boys would sometimes poke fun at me, calling me "Mr. Good Clothes," "Miss Nancy," and the "little gentleman," but such things did not disturb me. I would laugh with them, and not get angry. I feel that my clothes had a great deal to do in forming my character. They added to my dignity, made me take pains with my person, and gave me a certain self-respect. I looked forward with delight to my visits to Mr. Hamilton's on Saturday. His calm, dignified manner charmed me, and I took him for my model, and built air castles of how I, too, would be a rich banker, and sit in my office and transact business.

The day came when my private school education had to be exchanged for a collegiate one, and Bessie and Sallie Hamilton to be sent to a finishing school. It was my first taste of sorrow, to be separated from all the loved ones at home, and also from my dear little friend Sallie, who had been my good angel all these years. My family exerted themselves to make my leaving them as easy as possible. And as I looked at their array of presents I felt that I had never appreciated their love half enough, and how pleasantly they rallied me about my getting the honors! Dear ones, they never seemed to doubt once that I would come home without being decorated from head to foot with medals. And why should they not think so? They had seen me since a child get everything that I could desire, while they got nothing. Their faith in me was sublime. I kissed them all goodby, with a smile on my face, but a lump in my throat that I thought would choke me.

LUCKY READS THE LETTER.

The years at college flew swiftly by. I spent my vacations at home, and often filled the places of clerks in the bank who were taking their summer rest. At last my school days were over, and Mr. and Mrs. Hamilton and the girls, along with my father and mother and two sisters, came to hear my graduating speech. They had seats well in front, and although I was considered one of the good speakers in college, never in my life did I acquit myself so well as on that day. A look from Sallie gave me inspiration, and I threw my whole soul into the effort, and was congratulated by the president and professors, along with my classmates. I had not been at home but a short time, when Mr. and Mrs. Hamilton and the girls drove over to see us one evening after tea, and Mr. Hamilton asked me if I had decided what I would like to be. My father said he hoped I would be a lawyer. My mother wished me to be a doctor, in which Mrs. Hamilton joined her. But I replied, "a banker!" at which they all laughed, but Mr. Hamilton said a young man should choose his calling, one in which his feelings and heart entered. He also said he would write to New York to a friend of his, and see if he could not get a place for me in a bank there, where I would learn the business.

One day a boy drove up in Mr. Hamilton's buggy and handed me this note.

Mr. Lucky Landreth: Mr. Mason, our bookkeeper, was taken with a stroke of apoplexy this morning. Can give you a situation in the bank. We need you to-day; come at once.

Yours, L. H. HAMILTON.

I read the note aloud to my mother and sisters. My sister exclaimed: "Well, Lucky, I knew you would get a situation in that bank, even if some one had to die to make a place for you. And you will marry Sallie Hamilton, too."

"Hush," said my mother, "How ridiculous you

are! Lucky has never thought of such a thing."

"Well, he has looked it, and he will get her if he wants her. Mother, you gave him the right name. Lucky he has ever been; lucky he will ever be."

Out of the Ordinary.

SUSAN BROWN ROBBINS.

Annie Sargent was fifteen when her mother died; the three boys were older. Jabez Sargent never got along well with his children; he was too hasty and unreasonable. When his wife was alive she had often prevented wordy wars between her husband and the boys. Annie did not have her mother's tact, and besides, she stood in awe of her father. So when he scolded the boys she would look frightened at first, and then run away where she could not hear their angry voices.

When Will, the oldest, was twenty-one, he went to the city to find work. He had a hard time, but the folks at home never knew about it. He was capable and determined, so two years later, when Joe came of age, Will was able to get him a good situation. Only Fred and Annie were left at home after that.

It was only a month after Joe went away that Fred had a letter urging him to join his brothers in the city. "Why should you stay on that old farm, when you might be here with us earning a dollar and a half a day at least? Talk with father about it and let me know soon."

Fred looked up from the letter with bright eyes. "What is it?" asked Annie. She was clearing up the dinner table.

"Joe wants me to go to the city. He's got a place for me, and I can earn a dollar and a half a day at the very first. Do you believe father will let me go? Where is he?"

"Out in the barn." Annie's voice sounded strange to Fred, but he was hurrying out of the door. He glanced in at the window as he passed it. He did not stop, but Annie's face haunted him. He tried to think it was the unevenness of the window glass that distorted her features, but he knew it was tears that made her eyes so bright.

"I suppose you can go," said his father, rather ungraciously, "but I'd rather you'd stay here. You can help a good deal about the farm when you are a mind to,—but you ain't a mind to, most of the time."

Fred went back into the house. He was jubilant to think that he was going, but indignant at his father's remarks.

He got a piece of paper, a pen, and the ink bottle and began a letter to his brother. He wrote it hastily and had put it in an envelope before Annie came into the room. He could not look up just then, for he was writing Joe's name on the envelope. When he had finished he said, "Father says I can go, and I am going to take this letter to the postoffice right off. I told Joe I'd be there in a week."

Annie did not speak; her back was towards him.

Half a mile from the Sargents lived old Mrs. Millicent Jennings. She was a friend to all the boys and girls in the neighborhood, and even the older people were sometimes glad to get her advice, for she had a "level head." After Fred had mailed his letter he went directly to Aunt Millie's to tell her his plans. She was sitting in the kitchen knitting, when he went in.

"Well, what is it?" she asked, looking at him, "good news I guess."

He told her the news, and she listened quietly. She was silent so long after he finished that he began to be impatient. "What do you think of it?" he asked.

"I think," she said, slowly, "that you might have waited a little before you decided to go."

"What's the use to wait?"

"You might have thought of some things that would make you feel you ought to stay at home."

"What things? I don't like the way father treats me."

"Does he treat Annie any better?"

"I don't know's he does."

"How did Annie feel when the other boys went away?"

"Blue for a week."

"Who cheered her up?"

"I tried to,—father didn't seem to notice."

"It will be pretty lonesome for her if you go."

"I could write often and —"

"But you wouldn't."

"And I'd earn so much money that I could give her things she wants."

"I guess you'd find you could use all you'd earn for yourself."

"What! Do you think I ought to stay at home just for Annie?"

"Well, considering that she left school when she wanted to be a teacher, and gave up all her plans, and staid at home and worked hard just for Will and Joe and Fred,—it does seem rather tough for them all to desert her and go and do what they want to."

Fred looked very sober.

"Think it over," said Aunt Millie.

"But I've written," he returned, brightening a little.

"Couldn't you write again?"

"I suppose so."

"I hope I haven't made you angry, Frederick," she said, as he rose to go."

"Oh, no," he answered, somewhat shortly.

That night at supper there was hardly a word spoken. Jabez never talked at meal times. Fred was thinking. He looked at Annie furtively. Her eyes were red, and he thought she did not eat much.

When she began to wash dishes, he took the dish towel away from her. She looked at him in astonishment. "I can wipe them," she said, huskily.

"So can I," Fred answered.

He did not sleep much that night. The next morning after breakfast he followed his father out to the barn. He was gone a long time. When he came in there was a queer expression on his face; satisfaction, regret, resentment and high resolve. He got the writing materials and sat down at the dining table. Annie was paring apples. She watched him closely

"Want to send any word to Joe?" he asked, looking up. "I'm writing to him."

"Send my love," she said, and bent over the apples. Fred noticed, and smiled.

"Want to read it?" he asked.

"Yes," she said. "I'll wash my hands first."

She took the letter and began to read.

"Poor little girl," Fred thought, as he looked at her woe-begone face.

The woe-begone expression did not stay long. She looked up quickly, and saw him smiling at her.

She opened her lips to speak, but choked instead. She threw her arms around his neck and hugged him tight; it was his turn to choke, then.

"Oh, I'm so glad," she sobbed. "It would have killed me."

Fred had to write the letter over again, it was so crumpled up in the embrace.

This happened the last of May. When Fred told Aunt Millie about it the old lady looked pleased, and when he told her something else she laid her knitting down deliberately, walked over to him, took his face between her hands and looked into his eyes.

"If you do it," she said, "you are a regular—Well, we'll wait and see." Then she kissed him.

"What are you reading?" asked Annie one evening.

"A very interesting book," answered Fred, gravely.

She looked over his shoulder. "The cook book?"

"Why not?"

"Don't I feed you enough? Are you hungry?"

"I have enough to eat, but I want to learn to cook. Will you teach me?"

Annie laughed. "Get a few more who want to learn, and I'll start a cooking school."

Fred looked serious. "I'm not joking," he said. "Please take me seriously for once. Will you teach me to cook?"

"What do you want to cook for?"

"I have a feeling that perhaps I am a born cook. Who knows but what I may be the genius of the family! Think of the salary a French *chef* gets, and do not, I beg of you, refuse to give me my first lesson."

"If you are in earnest, you can come and mix up the bread," and Annie whisked off her apron and held it out to him.

Fred sprang to his feet and caught the apron from her hand.

"Why don't you have the strings longer?"

"They are long enough for me. "Here!—I'll pin it with two pins."

Fred brought a rocking chair from the sitting room, and made Annie sit in it. "Now tell me everything to do."

Fred took great pride in that bread, for it turned out well, and after that he insisted on making all the bread.

His success was not so good with other things. When Annie gave him minute directions he got along all right, but when he tried to go alone, he met with mishaps.

Fred kept his temper, and studied the cook book diligently. Sometimes he would take his perplexities to Aunt Millie.

"Say, Aunt Millie! I made an old-fashioned johnnycake this morning, and when I tried to turn it over it all fell to pieces; what made it do that?"

"Did the water boil when you put it into the meal?"

"Not quite."

"That is what's the matter."

Then the next time he saw her he would say, "I had the water boiling this time, and the johnnycake was A, number one."

Fred did not devote all his energies to the art of cooking. He worked with his father a part of the time, and Annie noticed, with surprise and pleasure, how well they got along together.

One evening in July, Fred said to Annie, "How long is it since you have been to see Mary Slocum?"

Mary Slocum was one of Annie's friends, who lived in the next town.

"I have not been there to stay any for two years."

"Haven't you got a standing invitation to go there and stop a month?"

"Yes, but——"

"Then write to her this very night and tell her you are coming next Friday to spend a week with her."

"How can I leave?"

"Father and I will be glad to be rid of you for a week," he said, jokingly. "I can cook,—you admit that my bread is better than yours. We shall get along all right."

The end of it was that she went, and had a good time.

"But they know so much," she confided to Fred. "I felt as though I didn't know a thing, and Mary does splendidly with her school."

They were washing dishes, and Fred carried a dish away, and in the seclusion of the pantry laughed softly and said to himself, "Just what I wanted."

"Let's take a walk," Fred said, after the dishes were finished.

It was a beautiful moonlight evening, and they walked along for some distance in silence. They climbed a big boulder and sat down.

"You see that building over?" began Fred.

"The schoolhouse? Yes."

"You know how hard it is to get a teacher who will stay more than one term?"

"Yes, it is so lonesome."

"Exactly. Well, before many more years have passed, you are going to be the teacher of that school."

"Why, Fred! What do you mean?"

"Just what I say, my dear."

"How in the world ——"

"Now, Annie, don't you say one word. Remember I am the oldest, and you have got to do just as I say." There was a determined note in his voice.

"You are a rather remarkable girl, and I want you to live up to your reputation by keeping perfectly silent while I explain. In two weeks examination papers will come, and if you pass the examination—and you must—you will go to the city and study to be a teacher. You will board where Will and Joe do, and they will look out for you. Your vacations will be spent at home here, and if you are very anxious, I'll let you do some of the work then."

"But, Fred! how can I go? It will be worse than for you to go."

"There is no question about it," said Fred, firmly. You are going. And now this next fortnight you must study hard. I'll help you what I can."

"But the money?"

"Never mind about the money—that's all fixed."

There was silence for a moment.

"Now say you are pleased."

But Annie could not speak just then.

Herb Robert.

How glad I shall be to introduce to you my little friend, Herb Robert, but you must follow me all about and in and out like the brook, if you wish

to see her in her castle. Come with me down these stone steps,—down, down, down. Here we are, on the brink of the narrow stream that has worn its way for a hundred feet through the rock. Now look up at the castle walls, with the damp moss growing all about, and see the little blushing beauty. This is my friend, Herb Robert, a tiny wild geranium with fern-like leaves, growing in the wonderful chasm. But should you look elsewhere to find another like her, remember that she loves the moss and the rocks—in damp, shady places—nor can she be persuaded to plant her roots west of the Missouri.

The Life of the Flesh.

S. M. FARNUM.

The French call the blood "running flesh;" the Bible calls it "the life of the flesh." To the naked eye it is a crimson fluid. A drop of it under the microscope shows a nearly colorless fluid, in which float cells, called red and white corpuscles and blood-plates. The red corpuscles look red only when seen in a mass; when examined under the microscope they are of a pale amber color. There are about three hundred times more red corpuscles than white, but they are slightly smaller. A cubic inch of blood contains seventy times as many red corpuscles as the world does inhabitants. Their special mission seems to be to carry oxygen. They get a good supply in the lungs, and rush off, brisk and rosy; they return blue, and loaded with the poisonous refuse for which they have exchanged part of their oxygen. They are exceedingly busy, for they must make the trip from the lungs and back in about two minutes. Perhaps the tiny red corpuscle has had to rush through arteries and capillaries to the tip of your little finger, then back through the veins to the heart, and from there to the lungs.

If you would like to know what the effect would be should these faithful servants be unable to perform their task, wind a piece of twine several times around your finger, so that the red corpuscles cannot return to the lungs for a fresh supply of oxygen. In a short time your finger swells and turns purple. If the twine is wound tightly enough and left long enough, your finger may die and actually mortify. But you will hardly care to carry the experiment so far, but will be glad to set the little corpuscles free and let them hurry back to the lungs for a fresh load of oxygen.

The white corpuscles are cells of protoplasm, having their own work to do. Now they carry needed supplies to a nerve, now to the brain, now to a bone, building up and repairing unceasingly.

The fluid in which the corpuscles float is called blood plasma. Among other things found in it is a substance called fibrinogen, which has saved your life by keeping you from bleeding to death when you have cut yourself or have had a tooth pulled. It aids in clotting the blood, and so stops its flow. The most skillful surgeon would be unable permanently to stop bleeding without the help of the soft, curly threads of fibrin which are formed in injured blood.

A strong muscular bag, about as large as your fist is the powerful force pump which sends the blood on its journeys to the different parts of your body. Put your ear close to some one's left side and listen to the regular rhythm of the heart performing its wonderful work. Can you not imagine it is singing as it works?

Throb, throb, throb,
I cheerily work on alway;
Beat, beat, beat,
I pause not by night nor by day;
Throb, throb, throb,
I send the red blood coursing free;
Beat, beat, beat,
My labors no mortal can see;
Throb, throb, throb,
My Maker will one day say "Peace;"
Beat, beat, beat,
My labors forever will cease.

Our Polly.

HELEN M. PRATT.

The gray African parrot, with brilliant scarlet feathers on its wings, is usually the brightest variety and the most easily taught. A beautiful great bird of this sort belonged to a family whose pleasant country home was next to the church.

Early Saturday afternoon, unless previously caught and carefully shut up, Polly would delicately pick her way to the very tip-top of a great cherry tree from which she could easily gain a view of the interior of the church, and would quietly wait here, without food or drink, until services began on Sunday morning. Then such a chattering and screaming and shouting as she would keep up. She did not hesitate to call out "Go on, old boy," to the minister, and laughed with such heartiness and evident contempt when the choir began to sing, that even the grave leader could, with difficulty, keep his countenance.

We children enjoyed this immensely, of course, and if we could have had our way, she would have spent all her Sabbaths in the old cherry tree. All attempts of the family to dislodge the jolly bird from her lofty perch were useless, for Polly's small feet were quite at home on the slender branches, and she well understood that none but a bird's light feet could safely approach the vicinity of her airy resting place, so she was caged.

Another trick of Polly's was to call the children into the house when they were at play, and as she could imitate to perfection the tones of father and mother, the children often considered her a great nuisance. "Sam, your mother wants you," or "Jenny, come quick, there is some one waiting for you," or, "Jenny, come in to dinner," were familiar refrains.

Polly also learned to imitate the speech of men driving horses, and a loud "whoa" would often bring a passing street car to a standstill, to the surprise of its driver, or a lively "Go along there" would start a sober grocer's or milkman's cart into a vigorous trot.

Poor Polly! We all loved her, in spite of her failings, and when she died of old age, and was buried in the little arbor at the foot of the garden, we attended the funeral, a company of genuine little mourners, and helped to plant flowers on her grave.

My Aquarium.

MRS. S. E. KENNEDY.

One day in early summer my little girl brought from the river a handful of tiny black specks each enclosed in a drop of glutinous substance, which she said was so plentiful, that in places, the water looked as if it were covered with a filmy veil.

I put these specks in a dish of water, and found the next day that each had detached itself from its sticky covering, and lengthened to an eighth of an inch.

In two weeks they had developed into tiny tadpoles, with heads very large in proportion, and long pointed tails. They were now ready for the aquarium, which the children helped me to arrange. We took a large glass jar and covered the bottom with river earth and small stones, in which we set out water cress, lobelia, and other water plants, among which was a good sprinkling of floating-heart, whose pretty red-brown leaves, lying flat upon the surface of the water, added much to the beauty of my miniature pond.

In a few days each tadpole had a tiny appendage sticking out from under its transparent tail, which was, in time, to become legs. Thus far matters had progressed much as I had reason to suppose they would, but after this time, I often wondered what spell had come over my little pets. For months there was no observable change, but, in course of time, two diminutive appendages were visible.

After awhile I obtained a large glass globe, and made a new home for my captives. The plants were reset, new ones procured, fresh earth put in, and soon the tadpoles seemed much at home. It was amusing to see them dive to the bottom of the globe when I put in the dipper to take out the soiled water, preparatory to cleansing the glass and putting in fresh. They would hide themselves so completely among the plants and small stones that not even a wiggling little tail was to be seen.

The tadpoles were not alone in their pretty glass house. Without knowing it, we had given them two water snails for company. These must have been hidden in the river mud, which we first put into the jar, for we soon saw them sailing back downwards upon the surface of the water. Perhaps I did not observe them closely, but I could not see that they differed materially from the land snail in appearance, though their manner of locomotion was decidedly peculiar.

In a short time there were several baby snails, about as large, when first discovered, as the head of a common pin. In time they were almost numberless, and snails, with perfectly formed shells, from the above size, up to the full-grown mollusk, were everywhere,—upon the sides of the globe, the surface of the water, and up and down the plants. One could watch for hours and still find something of interest in my little pond. It was the center of attraction for every child who entered the house, and even older visitors often stopped to inquire "What have you there?" one gentleman pronouncing it "a new industry."

Those tiny specks were brought to me about the middle of June. In April of the following year I made a discovery. One of my tadpoles had four legs, which were perhaps two inches in length when drawn out. He was a veritable little frog with big head and monstrous eyes, and a dark brown body about one inch in length.

It now comes often to the surface and clings to the grasses with its mouth out of the water. Not being capable of understanding his own wonderful mechanism he wonders, perhaps, why he cannot dive to the bottom of the pond and stay there as he used to do. He does not know that his gills have gone with his funny long tail, and that now he must breathe much as land animals do.

The poor little creature seemed much frightened when I took him in my hand to carry to his home which is to be, in the weeds by the river. I fear his after life will not be so kindly sheltered, but I dare not do otherwise than return him to his native element, where he may find food suitable to his changed appetite.

I was glad that the others were later in their transformation, as the weather was somewhat milder when I felt obliged to lose sight of them. They had furnished me many an hour's amusement, and I have never regretted that I made an aquarium.

Entertainment Fancies.

CARRIE MAY ASHTON.

At a recent Japanese bazar there was a "street" in two halls which presented a most unique sight. Brass, bronze and paper lanterns, such as the Kioto merchants use in their shops, were used for decorative purposes. Colored photographs, which were both inexpensive and attractive, added much to the otherwise quaint and odd appearance. One feature of the entertainment was a "tea house," where a cup of tea could be had at any hour. Many odd shaped tea-kettles were on exhibition, some of which were for sale. The attendants wore Japanese costume of many fabrics and styles, some being very elaborate.

A pineapple tea proved both pleasant and successful in the way of a church entertainment recently. Ices, jellies, marmalade, cake and individual shortcakes, besides the raw fruit, were served, as well as sandwiches, salads, cold meats and coffee. The pineapple shortcake met with a hearty welcome, as it was a little out of the ordinary bill of fare. Pineapple cushions, both large and small, and other trifles in fancy work, found a ready sale at a small side table.

At a pink dinner, given to a young woman on her marriage eve, the table was heart-shaped and covered with pink silk. The dinner cards were heart-shaped and pink. The men found in their dressing room two heart-shaped cards—one containing a man's name, and on the other the lady whom he was to take out to dinner. A vine of smilax encircled the table, and across the corners loose flowers were scattered. The banquet lamp, with its rosy shade, was wound with smilax. Pink roses—a single one for each man, and corsage bouquets for the ladies, were at each plate. The bread, ices and cakes were served in the form of hearts.

At a pretty little luncheon, which was given on a stormy day when the order for flowers could not be filled, the decorations were most unique. Large drooping cones hid among feathery branches of cedar beautified the pleasant rooms. The center piece was a ball of ivy formed of hoops through which peeped the loveliest blossoms. When the ribbons were pulled, which laid at each plate, the hoops of ivy were displaced and a mass of tiny bouquets came out of their hiding place, one for each guest.

Indiana was naturally so called from the great numbers of Indians who dwelt there at the beginning of the present century; and many other of our Western divisions bear Indian names—Illinois, Iowa, Kansas, Kentucky and Michigan, each meaning a "lake" in the tongue of some one of the savage tribes found living in the region.

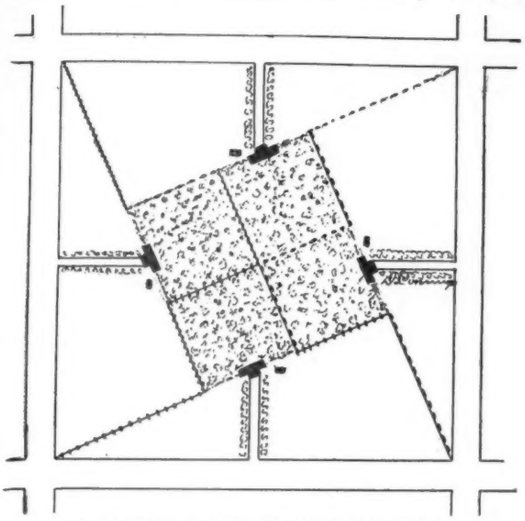
OUR LITTLE FOLKS.

Gladys and Maggie.

MARY KYLE DALLAS.

"Proudie, proudie,—nasty, stuck-up thing—proudie, proudie, yah!" cried a sharp little voice, from a ricketty doorstep at the roadside. Gladys, skipping past on her way from her cousin's, where she had been spending the afternoon, turned her head and looked full at the girl who was screaming these words.

She was a miserable little creature, with crooked shoulders and rumpled hair. Her face was almost as old as a woman's, and her eyes looked as spiteful as those of an angry cat. She wore a dirty, ragged Mother-Hubbard gown, that had been made for some grown-up person, and simply cut short in the skirt, without the process of hemming. The sleeves had been treated in the same fashion, and the sharp little bones of her elbows projected. Her face was covered with smudges and smears. Such a contrast she was to fair, fresh little Gladys, with her fair hair so nicely brushed and tied back with ribbon, her tiny sailor hat with its pale blue band, her white dress with its neat tucks, and her delicate feet in their pretty russet boots.



THE ANSWER TO THE SECTION FARM PUZZLE.

Gladys burst into tears and began to run homeward as fast as her feet would carry her. Her mother sat upon the porch with her crochet-work, and into her arms Gladys rushed at once, crying out,—"O, mamma! mamma! She said such dreadful words to me! She called me 'nasty, stuck-up thing,' and 'proudie,' and said 'yah.' Mamma, you don't know how I feel, I just hate her, I can't help it."

Her mother led her into the house, took off her hat, bathed her face and eyes with rosewater and took her on her knee. "What made her call me names?" asked Gladys.

"Envy, darling," said her mother. "That poor little girl is only nine years old. But she has had more trouble than many old women. Did you notice that she was deformed?"

"Yes, she was very crooked," said Gladys. "I guess her wickedness made her so—I hate her."

"She was an innocent baby when her drunken father threw her from a window and injured her back," said her mother. "And she has always suffered pain. Now he has wandered off, and left his family. Her mother is sickly and cannot earn much. The girl is alone in that wretched place, half the time. She never has had a nice frock, or whole shoes, in her life. She has not been taught to read, and has no way to amuse herself. She is not strong enough to romp When she sees well-dressed little girls, who have all they want, pass her door—girls who can skip and run, carrying beautiful dolls in their arms—she wishes she were like them. My pet, you must not hate her, you must pity her."

"I'll try to," sighed Gladys.

"And you must love her a little, too," said Mrs. Graham.

"I can *not* do that," said Gladys.

"You can try," said her mother. "You must not think of her as that ugly little girl, but as a soul, shut up in a miserable prison of a body, that makes people dislike her. You are a soul yourself, but you have a nice, healthy, pleasant little form and face, and parents who can give you all you need. Would you not like to make the little soul gentle and loving, and drive the hate from it, and make the poor body more comfortable to live in also?"

"Oh! I—I shouldn't know how," said Gladys. "I'll not hate her, and if it makes her sorry to see my nice clothes, I will never go past her door again. But—"

"But, Gladys, I want you to go *to* the door," said Mrs. Graham. Not now, but when you have said your prayers and slept all night, I think you will feel like taking poor Maggie Flack one of your dolls, and some cake. I do not wish you to go until you *do* feel like it, remember."

But when her mother kissed her awake next morning, Gladys cried out,—"Mamma, I *do* feel like it,—and I'll take Bettina to Maggie, after breakfast. What shall I say?"

"What you feel," replied her mother. And so, a little later, Gladys ran down the road, with a paper of cake in one hand and Bettina on the other, and found Maggie crouched, as usual, on the doorstep.

"Good morning. I thought perhaps you'd like these," said Gladys. "Her name is Bettina," and she laid the doll and the parcel upon the step and ran away.

The next day when Maggie saw Gladys coming toward the gate again, she held Bettina out, with a sort of smile. "She's awful pretty," she said, "and the cake was splendid. And you ain't no proudie, you're awful nice."

"I *never* feel proud, the way you mean," Gladys said. "Would you mind taking some frocks and shoes, and stockings? I have some here."

"*Mind!*" cried Maggie, "I guess not."

"And, if you wash your face, and fix your hair, the things will be more becoming," said Gladys, ready to run away in case of attack.

"You see if I don't then!" said Maggie.

A day or two after this, Gladys stopped at the gate again. "How is Bettina?" she asked.

"She is lovely," replied Maggie,—"and don't I look nice? I put on the dress with red flowers; and see my shoes," and she stuck out her feet. Maggie was as neat as possible, her face clean, and her brown hair braided. "Say," she said, with a little blush. "I thought you was stuck up because you had all them nice clothes, but you wasn't, and I ain't goin' to be stuck up over them poor young-uns with bare feet over to Morridges. I don't know but I'll let 'em see Bettiny go to sleep. And ma says I can keep the blue woolen dress to go to Sunday school with. I ain't been fit before, when the ladies told me I should come."

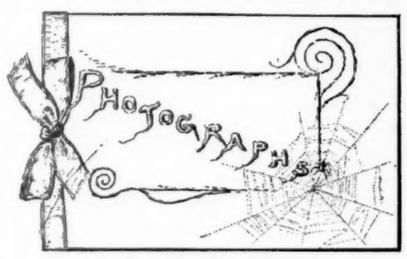
THE COTTAGE PUZZLE.

"O, do come," said Gladys, "and I'll give you a cape and a hat." And as she spoke, a strange, sweet emotion possessed her, and she felt that she loved, not only Maggie Flack, but all the poor children in the world. Not, to be sure, as she did the dear ones at home, but so that she just longed to give them all the best she had to give, and cause them to feel that they had friends among those who were better off, not enemies.

In the church sewing school, they taught Maggie fine needlework, and the other day Mrs. Flack was heard to say, "Maggie has taken to sewing, wonderful, and folks are giving her work to do already. I'm going to have real comfort with one of my children, anyway."

For Photographs.

An amateur photographer, and almost every one is that nowadays, will always appreciate a gift of a pretty case for holding his pictures. White crinoline made up over green surah is very effective. The case shown here measures five and a half by seven and a half inches after it is made up, and requires a piece of surah and another of crinoline, each six by twenty-one inches. Blind stitch these together and turn up the ends for three inches to form the pockets. Catch the pockets together with loops worked with buttonhole stitch or with crocheted rings, to give the pockets space to hold more pictures than if they were sewn flat. Fold together and tie with a band of green satin ribbon. The decorations are done in water colors in shades of green, gold and black, which will harmonize beautifully with the delicate tint of green as it gleams through the crinoline. Ferns make a very pleasing decoration. The case can be made of any desired size.



PRETTY CASE FOR PICTURES.

Our Puzzle Corner.

This month we give you a new kind of puzzle, which we call a Cottage Puzzle. Find hidden in the following paragraph all the names of the different parts of the cottage that you can. The name of the part may be hidden in one word or in parts of two or more words, but must be found in consecutive order. You cannot skip over a letter to form a word.

Blind Wallace Woodell is ill. His son Stephen is a short, frail lad, always boyish in glee at the base mention of being mad or merry, comic or nice. Usually slow in gait, he marched off, without cap or change, through the jam, but ran some for a new kind of pill, arrived on the post step, encouraged to do or die by that towering lass, the Muse girl, in telling him he was a "hero of the wind,—O, what a fast one."

To the one finding the longest list of parts, we will give two dollars in cash; for the next longest list a year's subscription to the AMERICAN AGRICULTURIST, and for the third longest list one dollar in cash. In case of ties, they will be decided by the neatest list. All answers must be addressed to Puzzle Editor, AMERICAN AGRICULTURIST, 52 and 54 Lafayette Place, New York, and must be mailed on or before July 1.

THE ANSWER TO THE MARCH PUZZLE.

There was not a single correct answer received to the March puzzle, but many of our young folks tried hard for it. So we shall award the prizes to those who sent in the nearest correct and best drawn diagrams. Perhaps the explanations were not quite plain enough—at any rate, it was a hard one, but we do not think any one regretted trying it.

THE PRIZE WINNERS FOR MARCH.

First prize, C. W. Jenks, Massachusetts; second prize, Frank F. Bradley, Michigan; third prize, O. P. Powley, North Dakota; fourth prize, C. S. Dean, Massachusetts; fifth prize, Arthur S. Prather, Kansas.

Agricultural Productions of Australia.

The system of farming carried on in Victoria stands in need of improvement, as the majority of men upon the land have not been trained as farmers, the tendency of these settlers being to confine their attention to growing a single species of grain. Victoria's rich soil and genial climate render her productions abundant and varied. It must always be remembered that the average of the whole colony is always lower than the results actually obtained by men who are trained farmers and understand their business. Such men will obtain from thirty-five to forty-five bushels of wheat, oats and barley per acre in districts where the general average is not more than fifteen to twenty bushels per acre. With potatoes, mangels, beets and peas, the same difference is observed between land under proper cultivation and farming of a rough and ready type. The statistics of the harvest for 1890 show that the colony produced 11,495,720 bushels of wheat, 5,644,867 bushels of oats, 1,831,132 bushels of barley, 157,104 tons of potatoes, 666,385 tons of hay, 4,111 tons of beets, 11,800 dozens of cabbages, 54,547 bushels of grass and clover seeds, 639,632 pounds of hops, 357,047 bushels of maize, 15,604 tons of mangel-wurzel, 10,815 tons of onions, 528,074 bushels of peas and beans, 1,251 tons of pumpkins, 3,337 cwt. of raspberries, 16,707 bushels of rye, 4,123 cwt. of tobacco, 1,578,590 gallons of wine, and 5,285 gallons of brandy, besides smaller quantities of amber cane, broom millet, chicory, gooseberries, thousand-headed kale, olives, opium, oranges, rhubarb and tomatoes (6,914 cwt.). In addition there was the produce of 29,243 acres of orchards, 155,596 acres cultivated for green forage, and 59,428 cwt. of grapes not made into wine. The standard weight of crops in Victoria is reckoned to be sixty pounds to the bushel for wheat, forty pounds for oats, fifty pounds for barley, and fifty-six pounds for maize. The actual weight, however, differs in different districts. The wheat, during 1890, ranged from fifty-five pounds to sixty-seven pounds; oats from thirty-five pounds to fifty pounds; barley from forty pounds to sixty pounds; and maize forty pounds to sixty pounds. In studying the market prices of agricultural produce in Victoria, many things have to be considered. The rent of land is low, labor saving implements and machines are employed, there is no expenditure for manures, and the taxes are low. There is, at present, about 2,896 miles of railway in the colony, and 13,553 miles of telegraph wire, a postoffice to every fifty-five square miles, and the letters dispatched and received in proportion to each head of population is 44.91. This shows the facilities the Victorian farmer has for interchange.

D. E. MARTIN, Secretary for Agriculture,
Victoria, Australia.

Good Roads in New Jersey.

In Morris county, which is in the hilly part of New Jersey, the road overseers supervise sections ranging from one-fourth of a mile to three miles. They are appointed by the town committees, and a portion of the road taxes appropriated to each section. In order to give a good idea of the different methods and results, I will describe the actual way the work is done under several overseers.

An overseer who has been on his section for several years, adopted the plan of plowing up the top of the higher points and hauled the ground, which is first-class material, being sandy and soft stone, to the lower points. The result is first-class improvement. The hills are lowered, the soft, low places become smooth and solid, and both dust and mud are done away with. He allowed one of the neighbors to haul the accumulation of sod that forms along the side of the road onto his fields to cover up a stump, to fill a low place, or to cover clayey ground.

The poorest of all possible material for making roads is the accumulation of sod alongside of the road formed from the dust of former years. But it is the best material to put in the field. Nevertheless, another overseer adopted this plan. He plows up the old dust sod and puts it in the road helter skelter, more particularly he endeavors to make the ridges or "turn waters" a little higher, and is sure to haul any sand that may have accumulated at the foot of some of the hills to the top, thereby keeping the hill as high as ever. He works out the taxes.

Other overseers work in various ways. Some have a machine that is drawn by four powerful horses to scrape all the stuff from both sides of the road and deposit it in the middle, making either dust or mud, to be continued as long as this system is continued, as it is generally impossible to make such material pack firmly.

J. FLOMERFELT, Morris Co., New Jersey.

Irrigation in the San Luis Valley.

The San Luis valley is in the southern part of Colorado. It is watered by the Rio Grande del Norte, and numerous small mountain streams. The valley has an average elevation of 7,500 feet above sea level. The Rio Grande is the principal source of water supply. All the streams flowing from the mountains into the valley north of the Rio Grande have no outlet, while those south of the Rio Grande have their outlet in that river.

The section north of the Rio Grande is known as the sub-irrigation section. The soil is a light, sandy loam, underlaid by sand and gravel to the depth of from forty-five to seventy feet. Natural ground water exists at from twelve to twenty-five feet from the surface. To cause the land to be sub-irrigated, water must be brought upon it in such quantity as to bring the ground water within from eighteen to forty inches of the surface, when the evaporation from the surface soil will bring the hygroscopic moisture in the soil particles to the roots of plants, and flooding is unnecessary. The land slopes to the east, and so the water is brought to the highest part of the west line of a quarter section, and carried as nearly level as possible in a head ditch along the west line. It is then turned out by means of small head-gates, into irrigation ditches, which are laid parallel about ten rods apart and run in straight lines one-half mile, which divides a quarter section into ten-acre lands or strips. This distance seems to be near enough to keep all the land sub-irrigated.

The best practice seems to be to plow land in the summer for a crop every alternate year. The land is so dry and thoroughly aerated that it seems to be almost impossible for any kind of vegetable matter or manure to decompose in it. The land does not need harrowing or working in any way after plowing, but it seems to settle just about enough from summer till the next spring to make a good seed bed. The least it can be stirred at planting the better, as the more it is stirred the longer it will take for the sub-irrigation water to come up again. As for keeping up fertility—it is thought that by flooding land before plowing and while the water in the streams is roily—that the sediment will not only keep up, but increase the fertility.

Our irrigated wheat is of the best quality, weighs sixty to sixty-two pounds per bushel, and, under the alternate system, makes from thirty to forty bushels per acre. Oats weigh forty-five to fifty pounds per bushel, yielding from twenty to one hundred bushels per acre. Potatoes, with no further attention than dropping the seed in every third furrow as the land is plowed, and digging them, produce one hundred to one hundred and fifty bushels per acre. Some of the farmers cultivated their potatoes once, some twice, and some not at all, and the crops seemed to be about all alike. It would be well to cultivate them perhaps, to dry out the ground if it should be too wet, but not otherwise unless to kill weeds.

J. R. PATTERSON, Costilla Co., Colorado.

Tennessee Tobacco.

The crop mortgage system is the ruination of the small tobacco grower, as it is also of the small cotton grower. He gives his attention exclusively to the one crop and is forced to purchase his living from the store. He easily falls behind with his finances, and has recourse to the crop mortgage, often mortgaging his crop before the ground is cleared on which to plant it. When the crop is made, he has no choice of markets, and is forced to take the first prices, be they bad or good.

I believe that in general the introduction of the tobacco industry has been detrimental to best interests of the country. Its production is more hazardous than any other kind of farming, and it seems to have nurtured the speculative tendency of the people. The attention of many has been given too exclusively to the production of the one crop, and when that has failed, as it often does, they having no other resources, are compelled to suffer. It appears also to have extended the use of the weed among the people.

Persons working constantly with tobacco naturally take to using it. This is a fact certainly to be deplored. Women almost as universally as men are addicted to the habit in the tobacco growing regions. Many of them chew and smoke just like the men, but the most of them use snuff, putting it on the end of a chewed stick and taking into their mouths. The manufactured snuff is as staple in the country store as flour. The culture of tobacco has occasioned the destruction of a great deal of excellent forest, a fact of no little import to one interested in the preservation of American forestry. It has also impoverished the land. So, taking it altogether, I believe that the cultivation of this weed should be classed with the manufacture of whiskey, as an industry not to be encouraged, and as detrimental to the best interests of the country. MARION RAMBO, Knox Co., Tenn.

Nitrate Beds in Colombia.

Immense nitrate of soda deposits have been discovered recently in the United States of Colombia, South America. As these beds are situated on or near navigable rivers, which run into the Caribbean sea, they are thus over 2,500 miles nearer the markets of the United States and of Europe than the Chili fields of niter.

The new nitrate beds are about thirty square miles in extent, and are from one to ten feet in thickness. They lie at Val du Tar, south of the spurs of the Sierra Nevada de Santa Marta, a distance of sixty-five miles from the city of San Juan de la Cienaga, and are in part on the waters of the San Sebastian river, which flows into the great sea level lake of Cienaga Grande, which is in the extreme northern portion of the Republic. These nitrate fields can be placed upon a direct line of inland navigation by connecting the waters of the Aracataca river with those of the San Sebastian, at a cost not exceeding $5,000. When the Santa Marta seaport railway is finished, it will run to the village of Fundacion, and within half a mile of the nitrate beds.

These deposits lie at a depth of from eight to twenty feet below the surface and rest on a strata of carboniferous sandstone. The caliche or saliterras itself contains, beside the niter, calcium sulphate, calcium carbonate, iron oxide, salt and magnesia. The deposit appears to be of recent date, and it is evident that the nitrate has been produced by the chemical reactions of vegetable substances and lime in its various forms.

These deposits promise a supply of over seven billion tons of caliche, assaying eleven and one-half per cent. of saltpeter on an average to the ton of raw material; one hundred parts of the caliche contains eleven parts of niter and two parts of phosphate. The calcium phosphate is fossil bone, and assays fifty-five pounds to the ton of caliche. It will cost from $8 to $11 per ton to separate the pure nitrate from caliche and deliver it in New York City.

S. M. MILLER, United States of Colombia.

Ranch Farming in New Mexico.

After leaving the made wagon road, and toiling up a narrow mountain cañon, one finds evident marks of civilization, rail fences, antique rustic gates, and we also perceive, in the distance, a cluster of log houses. We are now in full view of the Harvey ranch, which is situated in a hollow basin surrounded on all sides by rolling hills, on south and east by rolling grass-covered knolls, and on the north and west by heavily timbered slopes, which terminate in a narrow ridge which leads to the main range of the Rockies. This basin is extremely fertile, having been enriched by the wash from the surrounding hills for ages.

A part of the ranch is now laid off into neat little patches, here and there, all of which are surrounded by rail fences, made from the quaking aspens, which are found here in great abundance, and are excellently adapted for fencing purposes. We find a large field of heavy oats that cannot be excelled in any of the grain-growing States. They attain a height of seven and eight feet in places, and are so thick and heavy that it is a hard and tedious job to mow them with a scythe, they being

entirely too heavy to be cut with a mowing machine. Oats are cut when in the milk, and the dry wind soon cures them so they can be stacked for winter. They make a very rich fodder for the milch cows and horses during the winter months. The climate is such that the cattle can graze on the south sides of the knolls all winter; it is, therefore, necessary to put up food for the milch cows and horses only. We next find a large patch of potatoes. Las Vegas and the Hot Springs hotel furnish a ready market for all staple products.

I have lived on farms both in Kansas and Iowa, but have not seen so fine a crop of potatoes as are grown on this mountain ranch. All varieties of roots can be raised in great quantities, and they grow to an enormous size. Turnips, beets, carrots, parsnips, etc., grow luxuriantly. A splendid crop of barley, timothy, and other grains may be raised, also all early garden truck, such as peas, lettuce and onions, thrive luxuriantly.

A. H. BROWN, San Miguel Co., N. M.

The Fruit Industry in California.

Although Napa county is one of the smallest counties in California, and chains of mountains which pass through it, contain a great deal of land too broken and stony to be available for anything but pasturage, yet its rich valleys produce the finest fruits of the temperate zone. Even the highest mountains have sheltered nooks of rich soil, free from frost, where green and ripe tomatoes and green corn can be found in mid winter, and the fig ripens its second crop annually to perfection. Though called one of the Northern counties, we can grow oranges and lemons to perfection; in fact, north and south are very indefinite terms in this wonderful State, where nearly every valley has its own climate. While Napa county has long held a prominent position as one of the greatest producers of fine, light table wines, having over one hundred and eighty of the finest wine cellars in its main valleys, the ravages of the phylloxera and the low prices of wines and grapes have thrown a damper over this, once its leading industry, and many of the grape growers are now turning their attention to other fruits. The apple, pear, quince, cherry, apricot, nectarine, plum, prune, peach, olive, almond, walnut, fig, pomegranate, Japan persimmon, and all the small fruits seem equally at home. Those who eat our irrigated fruits fresh from the tree, and perfectly ripe, will find them as finely flavored as any. While fruit from irrigated trees is larger and more showy, it is also more watery, and cannot be expected to be as high flavored.

The Bay counties, clustered around the bay of San Francisco, always have an abundance of rains in winter which makes irrigation unnecessary, and our orchards and vineyards look as fresh and green after six months without rain, as in spring and midsummer, provided they are kept well cultivated. And yet we have abundant means for irrigating our small fruits, vegetable and flower gardens, as there are fine living springs on about every hillside, which never fail even in the dryest summer months. The scenery in the upper valley, and our smaller valleys and cañons, can hardly be excelled anywhere; the climate is as near perfection and as salubrious as can be, not too hot in summer nor too cold in winter. We are in easy communication with San Francisco, the town of Napa being but forty-six miles from the city, have two trains daily, and steamboat communication by Napa river and the bay. And yet with all these advantages, we have, perhaps, the cheapest lands in the State; there is room here for hundreds of industrious families, who can find paying work on a small piece of land all the year round, by raising a diversity of fruits, together with poultry and hogs, which always bring good prices. [The illustration is from a photograph of an Ohio Beauty cherry tree, planted in 1853, in the Evans' Orchard, Brown's Valley, Cal. It has yielded 1,500 pounds of cherries in one season, and fifteen persons were busy for three-fourths of a day in picking the fruit. The tree is thirty-six feet high, and over two feet in diameter.] GEORGE HUSMANN, Napa Co., California.

CHERRY GATHERING IN NAPA VALLEY, CAL.

Plant Growth in Dry Climates.

While Oklahoma is not situated in the arid or semi-arid regions, yet there have been and likely are to be "dry spells," of three to six weeks' duration, in the crop season; it is, therefore, essential to understand something of plants adapted to dry climates. There, weeds make a large growth of root and branch, or leaf, so that there may be much of juices, or of starch stored to tide over a period of deficiency in moisture. Our native plants and trees have these characteristics, and we should learn from them. The sorghums, saccharine and non-saccharine, with their large roots and thick leaves, with a stalk filled with sap, are our great drouth-resisters, and never fail to make a crop. They should be planted by every one in the further West for molasses, feed and seed, and sown for hay. In corn the largest stalk and heaviest leaf is to be sought. The larger and coarser millets do exceptionally well, and so of all kinds of vines, and plants having either large leaves or deep roots. In trees the catalpa and cottonwood are examples of successful growth here. The farmer and planter will do well to study the characteristics of plants, and select such as are adapted to the peculiarities of this climate, where, from dry weather and much wind, evaporation is very rapid.

J. M. RICE, Blaine Co., Oklahoma.

Rural Customs in Bulgaria.

In Bulgaria, men, women and children, all work in the fields, in planting or in harvesting, the mother often carrying her baby upon her back several miles from home for this work. Arriving at the field, baby is laid under a tree, or if necessary the mother can improvise a hammock with three sticks and a stout blanket and swing up the infant after the manner of a gypsy kettle, arranging her apron as a screen upon the sunny side.

The village house is simple indeed—one story, built up in basket work, of small sticks, or a rough frame filled with upright sticks or scantling, and plastered within and without with common mud mixed with chopped hay or straw. If the builder is able he then covers this foundation coat with one of lime or white earth, giving it a much more tidy appearance. The floors are often made of mud, but when dry are very hard and much neater than one who had never seen them would suppose possible. Often the whole family sleep in one room, upon blankets or mattresses spread upon the floor at night and folded up during the day, and many of them never even think of undressing. The queer little tables used in these homes are three or four feet across, and six inches high. Just imagine yourself a guest at one of them! You are invited to seat yourself and do so, more or less gracefully, according to the amount of practice you may have had, cross-legged upon the floor, getting as near the table as possible. One central dish of soup or meat, and forks are upon the table, also a loaf of black bread, unless it has been laid in some other convenient place. The hostess gives you a napkin, and the host takes a knife from his girdle and cuts a slice of bread for each one present. This is dipped piece by piece into the chief dish of the meal, and eaten as heartily as may be. Often the meat is too hot with red pepper, and too oily to suit a foreign taste. The people are remarkable for their hospitality. The dress of the peasants is so varied that it is impossible to describe it briefly. Each village has its own peculiarities in dress, and often quaint and picturesque costumes are seen. The women spin, knit, and weave the fabrics, and are the sole manufacturers of the simple, coarse raiment of the family; and a woman may be known to belong to this or that village by the color of the woolen apron, which is always worn. The life of these villagers is from childhood rougher than most of us can picture. Little children, dirty and ragged, are daily seen in winter, leading the beasts of burden to market with wood, hay or other produce,—objects of pity to bring tears to our eyes and a heavy heartache whenever we meet them, and are thus brought face to face with their apparently joyless and comfortless lives.

S. E. GRAVES, Shumla, Bulgaria.

Farm Oil Mills.—A small machine for crushing cotton seed and for separating the hulls, meal and oil, is asked for by a Georgia farmer who lives too far from a railway to ship his seed, but who has a water power he could use on his farm. We know of no small machine for this purpose, suitable for a single farm, but a few planters could readily unite to form a coöperative company to equip and operate a mill that would handle the seed of as many farms as it might be desirable to take in. Such an outfit would not be beyond the means of a small association of farmers. It could be run on the principles that have been so successfully applied to coöperative butter and cheese factories at the North.

An Asparagus Pest.—J. B. Cole, Harford Co., Md.: The beetle which is destroying your asparagus is undoubtedly the usual pest of this plant, *Crioceris asparagi*. The mature insects live through the winter under boards, bark, or other dry refuse. As soon as the asparagus bursts the ground they feed upon it, and lay eggs, which hatch in eight days. The grubs do much damage, and are full grown in twelve days, when they bury themselves in the earth for ten days, to come forth as perfect beetles. There are three broods during the summer. The best remedy is to apply freshly slaked lime in the morning, while the dew is still on the plants; but it does good at other times. Use a Paris green sifter, or make a duster of an old broom. Pyrethrum, or insect powder, either mixed with flour, or with water in the proportion of one ounce to three gallons of water, is also useful. Many Long Island gardeners lessen the ravages of the asparagus beetle by carefully keeping down all the young seedlings, upon which the eggs are usually laid, and forcing the beetles to deposit their eggs upon the new sprouts. As the latter are sent away to market almost daily, the eggs are finally killed, and the second brood is much fewer in number. This beetle was introduced from Europe, and was first noticed on Long Island.

Raising Ferrets.—George E. Parrett, Fayette Co., Ohio: The species of ferret employed in Europe for driving rabbits and rats out of their burrows is a quite tender animal, and would scarcely thrive in the climate of Ohio except in confinement, where it could have artificial warmth during the winter. These ferrets are not easily raised unless the breeder has thoroughly studied their habits and has all the conveniences for rearing such little animals. The common American weazel is closely allied to the European species, and may be taught to do the same work as his foreign cousin if one has the patience to rear and train it for this purpose.

Gapes in Chickens.—Mrs. E. O. Boone, Smith Co., Tenn.: Gapes are the result of parasitic worms in the windpipe of the bird. The most effective cure is to dislodge them. This may easily be done with a bent horsehair. The best preventive of the trouble is not to keep the chicks on ground where fowls have previously been.

Horticulture at the World's Fair.—C. P. Fisher, Philadelphia Co., Pa.: A complete history of horticulture at the World's Fair has not been published as yet, but descriptions of some special features have appeared in various periodicals. The Annals of Horticulture for North America for the year 1893, by L. H. Bailey, which will soon be published by the Orange Judd Company, gives a very complete history of all the horticultural features at the World's Fair, in addition to a great deal of matter valuable to horticulturists.

The Western Corn Root-Worm.—R. D. Cutshin, Leslie Co., Ky.: The small worms which are eating the roots of your corn are the larvæ of the Western corn root-worm, *Diabrotica longicornis*. The eggs are laid in the fall, and lie in the soil all winter, ready to hatch at the same time that the corn sprouts, and the little, maggot-like larvæ at once begin to feed upon the small roots, and at length burrow in the larger roots, doing much damage to the crop. They change into beetles in July, and may thereafter be found on the silk or on the tassels. The stalks often fall over as the result of the work of the worms weakening the roots. The only effective remedy known is the preventive one of not planting corn on ground which was cropped with corn the previous year. There is not a single case on record where the Western corn root-worm has injured corn on soil on which had grown and ripened the previous season either rye, wheat, or barley. Any one of these three crops rids the land of the corn root-worm in one season, and oats would doubtless do the same. The rotation of field corn with small grains not only lessens the ravages of this pest and the chinch bug, but also adds to the yield of all the crops, from the increased fertility of the soil, by the natural chemical action of the soil moisture upon the soil particles.

Perfect Rations.—D. T. Webber, Lewis Co., Mo.: A perfect ration perfectly supports and supplies the animal in good health up to yielding the largest amount of the best product, at the least absolute expense of money or expenditure of the vitality of the animal for the longest time. Rations that compel animals to grind out their powers for disproportionate food elements in return, are bad rations. These are unprofitable both to man and beast. Wheat middlings at the price of bran are cheap, if properly fed.

Sharpening a Scythe.—J. B. Farnham, Erie Co., N. Y.: The almost universal use of mowing machines has left so little use for the old mowing scythe, that the proper method of grinding it is almost a lost art. In grinding a scythe, always hold the edge toward you, with the point nearest you, and the heel farthest away, so that the stone will grind across the blade at an angle of about forty-five degrees. This makes a serrated edge, with the points projecting toward the point of the scythe. Hence in swinging the scythe through the standing grass these fine points catch hold and sever the fibers of the stalk. If these minute saw teeth were pointing towards the heel, the tendency would be to slip over the stalk. Thus it is that when scythes are ground nearly straight across the blade, they do not cut well. In using the whetstone, imitate the grinding, and, as the stone moves forward, pull it downward. Do not hold it too far under, but just level or flat with the blade.

Gates or Bars.—A. L. Daffs, Perry Co., Tenn.: In this age, when all farm operations should be done as expeditiously as possible, the old way of entering a field through the medium of bars or slip-gap is entirely too slow and unprofitable. It takes but a little while to construct a gate, and, when not used very frequently, some of the many forms of sliding gates can be erected. These can easily be made entirely of wood, excepting the few nails entering into their construction. They look much neater than bars, and are more convenient. Stock are liable to rub one of the bars down, making a tempting bid to get into mischief where the destruction or injury done would often build several substantial gates. All gates should be made a little higher than the adjoining fences, so no temptation to jump them will be offered. Build them substantially, whether swinging or sliding, of light, strong material, as a heavy gate strains the hinges and sags the post. It is also heavy work to slide it back and forth.

Blackberry Wine.—H. M. Craig, Burleson Co., Texas: A good recipe for blackberry wine is as follows: Mash the berries and let them stand covered until the pulp rises to the top, which will require three or four days; then draw off the fluid into another vessel, and to one gallon of the liquor add one pound of sugar. Mix well and put into a cask to work for a week or ten days, and throw off any remaining lees, keeping the cask well filled, particularly at the commencement. When the working has ceased, bung the cask. After six to twelve months, the wine may be bottled.

Ripe Seed on Flowering Plants.—F. L. Day, Modoc Co., Cal.: Such annuals as phlox, verbenas, petunias, sweet peas, and even pansies, are cultivated for their bloom and not for their foliage. To greatly prolong their period of bloom, it is only necessary to remove the flower as soon as it begins to fade, also to pick the flowers liberally as they open. Well arranged bouquets are an ornament to any room, and to see an abundance of flowers in the garden or upon the lawn, and no bouquets gracing the table or other parts of the house, looks as though the owner cared more for public opinion and outward show than the attractiveness of the home. The formation of seed is very exhausting to any plant, and one flower going to seed exhausts the plant more than taking into full bloom half a dozen flowers. Frequently a neighbor has no pretty flowers, and an occasional bouquet will not only please her, but prolong the bloom of your plants. A little bouquet is a very acceptable present to a sick friend or neighbor.

Fast Driving.—L. T. Cyrus, Pope Co., Minn.: There is something quite exhilarating in the act of passing over the highway at a rapid rate, and that is nearly all there is to be said in its favor. There are many times when there is an excuse for driving many consecutive miles at the utmost speed, such as in case of sickness, to catch a train, or meet an important business engagement, but when a person habitually drives at a rapid gait, regardless of the condition of the roads, a protest should be offered. We all know a great many good, substantial, conservative, successful men who never drive at a foolhardy speed. They make their calculation as to how long it will take to reach a certain place, and start in time to reach it without undue haste. If the horse killers and wagon shatterers would start a few moments sooner, they could reach the point desired on time. If they own their rigs, they would be many dollars ahead at the end of each year. Remember fast driving is only advisable with fast, limber horses and light, durable vehicles.

Testing Dairy Cows.—Dairyman, Chenango Co., N. Y.: You should get a Babcock tester. The average of butter per cow is much too low in your dairy, and you can in no way so cheaply and successfully weed out the cows which are not doing their duty in the butter-making line. Cream gauges are not reliable. Get the Babcock tester by all means, and you will always be glad that you made the investment.

Pollenizing Bartlett Pears.—J. M., Douglas Co., Kan.: Your two Bartlett trees need pollen from other varieties, in order to give you good crops of good fruit. As you say you have no other pear trees it may be possible that your neighbors are similarly situated, and thus wind, bees and insects generally cannot aid in the fertilizing work. Recent research has shown that a Bartlett pear, depending on its own pollen, will either give no fruit, or, if it does, will produce pears not at all like the typical Bartlett. Cross-fertilization is needed, and there can be but little doubt that it is beneficial to all kinds of fruit.

Separator Cream.—E. C. Long, Erie Co., N. Y., writes us: The statement in the March number of the AMERICAN AGRICULTURIST that cream taken from the milk by the separator will not whip, does not accord with my experience. I have been furnishing cream taken from the milk by a De Laval Baby Separator to several of my butter customers, and it has given the best of satisfaction. They all say that the cream I furnish whips satisfactorily, while cream bought of the milkman will not whip. The separated cream is, according to my experience, more uniform and in every way superior to that raised by gravity process.

Summer Management of Raspberries.—A. M. Thayer, President of the Wisconsin State Horticultural Society, gives this timely advice: "After clean cultivation and hoeing, apply summer mulch to raspberries and blackberries early in the month. Green clover cut in the blossom and applied at once is best; it should be placed continuously along the hills, about three feet wide, and from four to five inches deep, leaving a clean place in the center of the row for cultivation. Clover as a mulch is easily applied; it lies in a compact mass, retains the moisture, is free from weed seed, keeps the berries clean, and enriches the soil. Coarse manure or straw will do where clover cannot be obtained, but is objectionable, as it contains many seeds of noxious weeds. When the new canes are twelve or fifteen inches high, nip the tops back about two inches; this will cause numerous laterals to grow, which should be trimmed quite severely in the fall or

spring. The pinching back of the new growth is important; it largely increases the bearing surface, and keeps the bushes low, strong and well formed. Cultivate frequently and shallow when ground is dry, also as soon after a hard rain as ground will permit. Frequent cultivation retains the moisture near the surface and makes plant food more available."

Currant Borers.—M. A. Thayer, Monroe Co., Wis., writes: Currants and gooseberries have been much injured by the borer. As soon as the leaves start the affected canes are easily discovered, and should be cut out as far down as the pith or center of the branch is eaten out, and burned at once. This should be done early, as the egg is laid about June 1st, and as soon as hatched the young borer eats its way into the cane and remains until the following season.

The Primate Apple.—Subscriber, Newark, N. J.: We would not advise you to plant Primate for market to any considerable extent, but would certainly add a tree or two for home use. It is a summer apple, a little after the ordinary Harvest types, of good size, yellow skinned when ripe, and of the finest quality. We think you will make no mistake in planting, as you propose, for fall apples, the Gravenstein and the Red Beitigheimer. The former is handsome and superb in quality and the latter is very attractive, while the quality is good.

A Desirable Rose.—Susie S., Kingston, N. Y.: The Paul Neyron is a hybrid remontant, or hybrid perpetual, as this class is also called. The color is a deep rose, a little fragrant, a free bloomer, an upright grower, and the rose is the largest in size. It is a somewhat tender, and it will pay to give it a little winter protection.

Trees Close to Buildings.—C. H. Dana, Bates Co., Mo.: While it is very desirable to have both fruit and ornamental trees about the house and farm buildings, yet their too close proximity is positively detrimental, as with trees that extend their branches against a building or overhang the roof. In the latter case, if of shingles, the shade from leaves and branches prevents rapid evaporation, and the portion thus affected will need replacing years before the remainder. Not only this, but the leaves and litter stop up the gutters, rendering the cistern water filthy. Thick foliage also renders the rooms under its influence dark and damp. Of course no one plants trees with the above detrimental objects in view, yet it is always best to look a generation or more ahead in setting trees in any locality, and imagine how a well-developed specimen of the same species would look in both height and expanse, for if the little slip now being planted should live, it may develop wonderfully. Never set trees about a building expecting to remove a certain number of them in ten or fifteen years, for you will not do so, or will remove them very reluctantly. You may crowd some trees on the lawn, but give the buildings a wide space for air and sunlight.

A Succession of Vegetables.—C. L. Allen, Queens Co., N. Y., writes us: Now, while the garden is yielding its vegetables in profusion, is the time to continue making the garden, that is sowing the seeds for a succession. Another sowing of peas should be made, a few feet in row of radishes should be sown, at intervals of a week, also a small bed of lettuce should be prepared. A planting of snap beans, and another fifty hills of sweet corn, will be in order. The beets, now so tender and sweet, remind us that, to have them the entire season, another sowing should be made.

Preserving Shingled Roofs.—J. L. Nath, Orange Co., N. C.: If durability in a shingled roof is the point desired, thoroughly coat the surface during a dry time with all the linseed oil, either boiled or raw, that the shingles will absorb. This is the cheapest plan to follow, and is thoroughly and expeditiously accomplished by the use of a knapsack or common pail spray pump. The operator stands upon a ladder or near the eaves of the roof, much of the oil is thereby thrown up under the buts of the shingles, enough oil being applied so that some of it will flow into the gutter, and by placing a vessel under the discharge pipe this surplus oil is not lost. By applying when the roof is very dry you will be surprised at the amount the shingles absorbed, sawed shingles taking in more than those cut or shaved. Many use crude petroleum, as it is very cheap, and at the same time effective. Linseed oil does not give the roof a streaked appearance. It simply gives it a darker hue, and for a few months quite a glossy look, adding many years to its efficiency. A roof that has been laid several years, is in just the condition for the application of oil. If a roof must be painted do not use a black or any similar color, which absorbs much heat from the direct rays of the sun. This in turn causes expansion, contracting when cool, a condition injurious to the fiber of wood, coating of paint, or metal itself.

Repairing a Stove.—M. B. Garrison, Greene Co., Penn.: The part of a cook stove most liable to get out of order is the corrugated cast iron face or lining, back of the fire pot, or the piece or guard between the fire and the thin coating of the front part of the oven. This piece, being simply set in place and located where it has the full effect of the intense heat, warps, or is burned away so badly in a few years that the heat strikes directly against the oven walls, thus causing the oven to bake more at the top than at the bottom. Many housekeepers try to overcome this condition, if possible. Not only is this a great disadvantage in baking, but the permanent portion of the oven plate, thus exposed to heat more severe than it was intended to stand, is often burned out or badly cracked, so that ashes sift down upon the contents of the oven. The best plan to follow is, just as soon as the corrugated back piece gives out, to obtain a new one. The old one may be left in place by cutting a strip the same size from sheet iron, or a piece of an old stovepipe, and supporting it in front of the old, with a piece of wire. Thus it will last at least one year, and save the most vital portion of the stove from ruin.

Lettuce and Radishes.—H. Calvert, Philadelphia Co., Pa.: 1. The varieties of lettuce which produce good heads are raised principally in hotbeds and forcing houses in winter and early spring. These same varieties, when grown in the garden, seldom produce heads, but, after producing a half dozen or more large leaves, throw up the seed stalks of which you complain. As you say nothing of hotbeds, we presume you have been trying to raise Boston market and similar varieties of lettuce in the garden; hence your failure to get good heads. 2. Radishes grown in hotbeds, and in very rich soil, are not quite as hot and spicy in flavor as those raised in the open ground, but all the varieties we have ever tried have the sharp, pungent taste which is a characteristic of the mustard and cress family of plants.

Weeping Trees.—F. Saxtaeder, Morris Co., N. J.: Nearly all of the small weeping or pendulous-branched trees in cultivation are naturally trailing shrubs creeping over the ground, but by budding or grafting them upon strong growing stocks to form stems for their support, we secure handsome little trees, such as the Kilmarnock and American willows, weeping mulberries, cherries, elms, and lindens. The common large weeping willow, cut-leaved maple, beach and birch, grow so strong and rapidly that they produce central or main stems for themselves, their branches becoming pendulous, and continue so through life. It is, of course, possible to train up a main stem to the proper height, from cuttings or layers of the smaller kind of weeping trees, and then cut off the top and train a head to suit, but this is a slower process of propagation than grafting upon strong stocks; consequently, is rarely practiced by nurserymen.

Loss of Butter Fat, and Souring of Milk.—A. B. Warrell, Harrison Co., Iowa: In answer to the question "What causes the loss of butter fat after the milk sours, and what is there in milk that sours?" Prof. E. H. Farrington writes us: The amount of butter fat destroyed by the souring of milk is very small. All the investigations that I have made on this point indicate that no appreciable amount of fat is lost by the souring of milk and cream. On April 4th, 1894, I tested two samples of sweet milk for fat by the Babcock method. On the same day I added the requisite amount of these same samples of sweet milk to twenty Babcock test bottles, and set them in a warm room, where the milk in these test bottles soured very fast. April 17th the milk in these bottles was very sour, curdled, and the surface of the milk covered with a white mold. The necessary acid for making the test was added to two of these soured milks on April 17th, the test made in the same way as when the milk was sweet, and I got practically the same per cent. of fat as before. I intend to keep the remaining eighteen samples, measured out on April 4th, let them sour as much as they will, and test for fat at intervals of a week or month. The two samples tested on April 17th had soured much more than will ever occur in ordinary dairy practice, but I wish to test a very extreme case of souring, in order to note the loss of fat, if there is any. When the milk sours there is a decomposition of the milk sugar and casein. If the butter fat was completely separated from the milk sugar and casein of milk, there would probably be no change in the fat. Cream and butter contain the same constituents as are found in milk, but in different proportions. The milk sugar and casein are in much smaller quantities in cream and butter than in milk. It is the fermentation of curd that causes butter to become rancid. This curd is almost entirely casein, which is the food of the bacteria that cause the fermentation of milk, cream and butter.

A Ten-Acre Farm.—Galvestonian, Galveston Co., Tex., wants to know if he could make seven hundred dollars annually from ten acres of land in Texas. The land which he proposes to occupy is now low prairie and has never been broken up, but is in a state of nature. There are men who have made, and are making, more than the sum named from ten acres of garden, while at the same time there are probably many planters in Texas cultivating more than ten times ten acres who would feel pretty well satisfied if they could show seven hundred dollars' profit annually from their plantations. Much depends upon the man, the climate, the season, the soil, and convenience to a good market. For one who knows nothing of gardening or farming, the best thing to do is to learn the business before attempting it, by working for someone successful in his special business.

Scotch Broom from Seed.—M. B. Fulghum, Spalding Co., Ga.: Scotch broom seed usually sprouts very freely, if sown in the fall, or soon after it is ripe. Old seed might fail to grow, and this may have been the cause of your failure. Get some fresh seed this fall and sow in a well prepared bed and in a half shady situation, covering the seed about an inch deep with fine, rich soil, and we think that you will find the plants will appear the following spring. If you have old seeds on hand now, mix them with sand in a box or flowerpot, pour on some warm water and set in a warm place—for instance, on the south side of your house, close up to the wall, and where the sun will shine on the vessel containing the seed, and then keep wet until the sprouts appear; then sow in a half-shaded bed, and moisture will start the seeds, if there is any life in them.

Grafted Chestnut Trees.—Constant Reader, Carbondale, Pa.: Without attempting to explain the reason why it is so, the fact is well known to every propagator of the improved varieties of the chestnut that the grafted trees are very precocious, and will, as a rule, produce nuts when not more than two or three years old, while seedlings of the same rarely produce fruit under ten or twelve years. There is far more danger from over-fruitfulness than unproductiveness in grafted chestnuts, for there are few persons who will have the courage to remove or thin out the crop of nuts on young trees, which is often necessary to prevent stunting the growth of the plants. It would be much better not to allow very young trees to bear at all, than to stunt their growth by over-bearing, but impatience to reap an early crop often ends in a half crop, or none.

Improving Agricultural Fairs.—E. P. Powell, Oneida Co., N. Y., writes us: We are evidently on the road to a general revolution in agricultural fairs. These institutions are not any longer so freely and cheerfully patronized by the States as formerly, because of a growing conviction that the prizes do not contribute to the advancement of farmers' work. I see that some of the Pennsylvania counties offer prizes for the best kept houses and house grounds. Delaware county offers a yearly prize for the best school grounds. This is a move in the right direction. Half of the money paid for exhibited flowers and fruits is thrown away. There might be further innovation in the way of prizes covering care of cattle, well-kept houses and barns, sanitary condition of sewers, wells, stables, cellars; prizes for milkmen who adopt the best methods for securing thoroughly wholesome milk for their customers. The field is a large one, and there is room for improvement.

SCIENCE IN FARMING.

Early Tomatoes.—The experiments with tomatoes at the Maine station are reported by W. M. Munson (B. 9) as emphasizing the value of setting tomato plants as early in the spring as possible. Plants handled in pots previous to setting in the field are more vigorous and productive than those not so handled. This fact is of much importance to the market gardener, who wishes hardy plants which give large returns. The individual variation of plants of any one variety is often so marked as to obscure the effects of different methods of culture, and to prevent the forming of reliable conclusions from one season's crop. The productiveness of any given variety may be largely increased by crossing with some of the smaller, less valuable sorts. But the new variety will often quickly deteriorate, and the increased productiveness be wholly lost in a few years, even under good culture. Seeds from plants grown under the best house culture, may give the best results. In the crosses made, the combining of the Lorillard-Currant hybrid with Lorillard, the size was doubled and the quality much improved, but the number of fruits was lessened. The most promising novelties were the Burpee's Climax, the Maule's Earliest, and Brinton's Best. In the cool climate of Maine, Ponderosa, Buckeye State, Royal Red and Stone were too late; Lemon Blush lacked its distinguishing characteristic, and Terra Cotta was of inferior quality.

Texas Cattle Fever.—The Southern cattle fever is a disease of the blood, caused by a microbe which lives within the red blood corpuscles, and feeds upon all parts of the blood. It is present at all times in nearly all cattle bred in warm climates, as has been proved by microscopic examination. A. T. Neale of the Delaware station recommends (B. 23) that, as the microbe of this disease is carried from Southern to Northern cattle by ticks, farmers should satisfy themselves at the unloading stations of the railways in the vicinity, that strange herds have not come from territory infested with this fever. If an animal be sick, or dies under suspicious circumstances, notify the nearest agricultural experiment station, detailing symptoms. In the Southern cattle fever, the usual symptoms of fever will be seen. The sick animal will leave the herd; if in milk, the flow will cease; if water is accessible, it will be used as a standing place. At times, steers and cows affected with this disease, will charge upon men who enter the field. The animal becomes constipated, the urine in many cases is high colored, almost black, but if it is voided into water, its true color will be found to be that of blood. If slight cuts are made into the skin little blood will flow, and it will be noticeably thin, light colored and watery. Ticks may be found on the udder, on the escutcheon, and oftentimes along the milk veins. Owing to the danger of human infection from anthrax, if a farmer makes any post-mortem examination, he should use all the precautions followed by a surgeon, and if the blood be found thick and black instead of thin and light red, he should immediately telegraph his experiment station, or his State veterinarian for assistance in a suspected case of dangerous anthrax. In Southern cattle-fever carcasses, the blood is light colored, the liver is yellowish and enlarged, and the spleen or milt is swollen with blood, and enormously overgrown.

Field Corn on the Prairies.—On dark-colored, fertile prairie soil, with a yellow clay subsoil, the Illinois station has made careful tests with maize, through six seasons (B. 31). G. E. Morrow and F. D. Gardner report that the tests indicate that medium, rather than either early, or late maturing, varieties do best. The largest yields of shelled corn have not been secured from varieties with the smallest cobs, or with the deepest kernels, or, in all cases, with the most symmetrical ears. Home varieties and home-grown seed have proved best for field corn. No one variety has been shown to be greatly superior to all others. The yield does not seem to depend upon either the color of the kernel, or on the exact shape of either the ear or the kernel. The advertised claims made for many varieties have not been sustained. Corn obtained from different sources under the same name often differs materially. Seed corn, with differing names, often proves much alike. The results of experience with crossbred varieties, suggest the importance of thorough trials of the practice of crossing desirable varieties. In five years out of six, planting at the rate of at least 12,000 kernels per acre, or about four kernels to the usual hill, has given the larger yields, though the ears and stalks are smaller. There should be an average of at least three stalks to a hill, or the equivalent in drills. The later planted corn required the least cultivation. Shallow cultivation has uniformly given better results than deep. Intentional root pruning has in all cases decreased the yield. No one implement has been shown to be clearly superior to all others. It is believed that the best results can be secured with the smallest expenditure of time and labor, by having the ground in good condition at planting time, beginning cultivation before grass or weeds have made much growth, and stirring the entire surface of the soil as nearly as practicable to the depth of not more than two or three inches, often enough to keep the surface well pulverized, and to prevent the growth of weeds and grass. In each of the six years, yields of corn, not much below the average, were secured without any cultivation subsequent to planting, except scraping the surface with a sharp hoe to prevent the growth of weeds. Repeated observations have shown that the percentage of dry matter in the American corn plant, both stalk and ear, increases up to the time of ripening. It has not been shown that the digestibility is decreased as maturity increases. In many cases the palatability of both stalk and ear does decrease. It seems clearly proved, however, that there frequently has been a considerable loss in the total food value of the maize crop, by cutting it at too early a stage, either for silage, or for dry fodder.

Chemicals in Irrigation Water.—The water of the Rio Grande river, which ranks high for irrigating purposes, has been analyzed by A. Goss of the New Mexico station (B. 12). Owing to the great amount of gypsum continuously present in this water, the alkali deposited from it is of the white variety, which is much less injurious than black alkali, the gypsum being an antidote for the latter. The best method of removing alkali from land is by the use of water, dissolving and washing it out through drains. If not very abundant, alkali can often be removed by growing crops which take large quantities of such chemicals as food. Frequent cultivation tends to counteract the effects of alkali, but, of course, cannot remove it from the soil. If possible, river water should not be used for irrigating immediately following a rise due to heavy rains coming after a protracted dry period, as it would then contain more alkali washed from the land. The water with a heavy brick-red sediment, locally known as Rio Puerco water, should not be used, if possible, as this water was found to contain more alkali than any other. More plant food is probably added to the land each year, by using two feet in depth of the river water in irrigating, than is removed by crops; hence, by using that amount of water, the absolute exhaustion of the land is probably impossible. The most of the plant food is in the sediment, hence in irrigating it is desirable to get as much sediment on the land as possible. It is estimated that over eighty thousand pounds of sediment in a layer one-fourth of an inch thick would be added to each acre in one year by using two feet of water. This sediment would contain 1,821 pounds of potassium sulphate, 116 pounds of phosphoric acid, and 107 pounds of nitrogen. The water would supply, in addition, about 90 pounds of potash. Hence by using an abundance of muddy river water, the fertility of the land in the Rio Grande valley could be indefinitely maintained.

Flavoring Butter by Bacteria.—From investigations through six years upon the microbes of milk, and the artificial ripening of cream, in the biological laboratory of Wesleyan University, and in the practical works of creameries, by H. W. Conn, of the Connecticut station at Storrs, he reports (B. 12) that the chief object of the ripening of cream is to produce the butter aroma, which, though very evanescent, controls the market price of butter. This flavor the butter maker owes to certain bacteria, for by their growth the materials in the cream are decomposed, and the compounds formed which produce the flavors and odors of the best qualities of butter. Different species of bacteria vary much as to the flavors which they produce, some giving rise to good, some to extra fine, and others to poor qualities of butter. A majority of our common dairy species produce good, but not the highest quality of butter. Up to the present time the butter maker has had no means of controlling the species in his cream, but has had to use those which abound in the neighborhood. The bacteriologist can isolate and obtain, in pure cultures, the species of bacteria which produce the best flavored butter. He can furnish them to the creameries to use as starters in cream ripening, just as superior qualities of yeast are now furnished to the bakers. This artificial ripening of cream promises much for the near future, although it has been applied only on a small scale in America. The use of a pure culture of a species from Uruguay improved the flavor of the butter of a Connecticut creamery over twenty per cent., according to expert estimates. Most species of bacteria in bad butter are probably associated with filthiness. Hence a careful inspection of the barns and dairies to insure proper conditions, especially cleanliness, will be a means of avoiding much of the trouble in cream ripening, and will, in many cases, result in a marked improvement in the butter.

American Corn Culture.—Farmers who have been compelled to plant their field corn late, will be interested in the statement by W. C. Latta, of the Indiana station (B. 50) that the later the trial corn was planted last year, the shorter the time required to mature the crop, the extreme range being seventeen days in favor of the latest planting. The best yields of corn, however, were produced from plantings during the first ten days in May. As a rule, the yield of corn was proportionate to the thickness of the stand, but the size of the ear was reduced by thick planting, where the stalks stood closer than ten inches apart. It is, therefore, advisable to plant thickly for silage, while a medium stand will prove more satisfactory if the crop is to be husked. Plowing eight inches deep, gave better yields than shallow plowing. Shallow, level cultivation has generally produced the best yield of corn, but the difference in yield from cultivation, ranging from one to three inches deep, is comparatively small. Much better yields of corn have been produced by growing this crop in rotation with other crops, than by growing corn every year on the same land. The average increase in yield of corn from rotative cropping is over sixteen per cent. for the corn crop of six years. Fresh horse manure has produced a marked and lasting effect on the yield of corn. The effect of such manure on both growth and yield was very perceptible in the tenth crop after the manure was applied. High grade commercial fertilizers and horse manure have, in some years, greatly increased the yield of corn, but, as a rule, the immediate return in the first crop has not repaid the increase in cost, though this may be repaid in future crops. The good effects of fertilization are curtailed in both dry and wet seasons because, in a dry soil, the added fertility does not readily become available, and in very wet weather it is either partly washed from the soil, or it produces a too rank, and therefore unprofitable growth.

Blackberries and Raspberries.—The horticultural experiments at the Illinois station are reported by G. W. McCluer (B. 30) as indicating that the standard varieties which have stood a long test over a wide range of country are still the safest to plant. In blackberries, the Snyder took the lead, and the Minnewaska ranked second, being not so good in quality as the Snyder, but full as productive and not so liable to injury from drouth. For an early variety the Early King is hardier than the Early Harvest. Of the black raspberries, the Kansas has proved the best, followed by the Gregg, or the Nemaha, and the Palmer. The Turner is one of the most productive of the red raspberries, and is hardy and healthy. The fruit has a mild, very pleasant taste, but is too soft to withstand shipping to a distance. The Cuthbert proved healthy and nearly as hardy, the fruit larger and firmer, but for home use the taste is rather harsh. The Philadelphia was very productive, healthy and hardy, the fruit smaller than that of the other two, and very liable to shatter in picking. The black raspberry will repay very much better cultivation and weeding than it usually receives. The rows of black raspberries in which the old canes were left until the regular spring pruning, yielded nearly twice as much as those rows from which the fruiting wood was removed as soon as the berries were harvested.

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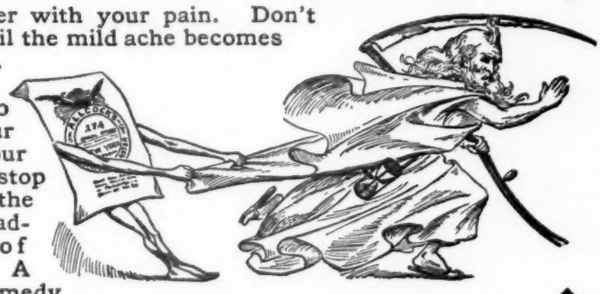

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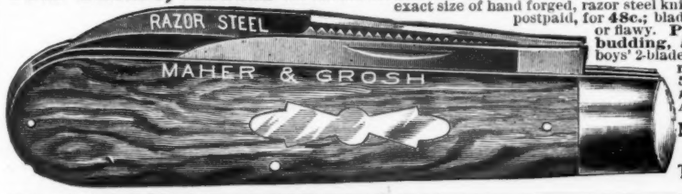

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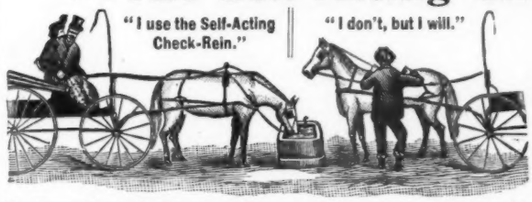

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FARMING IN FOREIGN LANDS.

Lucerne (alfalfa) growing has proved eminently successful in the dry districts of Australia.

The Hessian fly is reported to have done great damage to the wheat fields of New Zealand last season.

India ranks third among the countries of the world for wheat production. Its total wheat crop last year was 203,000,000 bushels.

The British chief secretary for Ireland has been urged to establish a department of agriculture in Ireland. His reply is very encouraging to the friends of the project.

An Australian farmer reports a crop of seven hundred and fifty bushels of Algerian oats from ten acres of land. Another one eclipses this by a crop of eighty bushels to the acre.

The American trotting horse is becoming popular in Italy. Of the 893 private stallions in that country which were approved by the official inspectors, seventeen were American.

The French have introduced coffee culture in Tonquin with good prospects of success. Both the Liberian and Arabian varieties of coffee trees are in cultivation, and all are reported as doing well.

New Zealand flax, *Phormium tenax*, is a plant of the lily family, and it is calculated that not less than eighty varieties of it are grown in New Zealand. It is also grown, to some extent, in the Chatham and Norfolk islands.

The dairy industry has grown rapidly in New Zealand. The exports of dairy products advanced in twenty years from $45,000 in 1872 to $1,590,000 in 1892. The colony now has 174 establishments of all kinds for the manufacture of butter and cheese.

The death is reported on a South African ostrich farm of a male ostrich named Saul, which was known to be at least fifty-five years old. At one time the plumes from a single plucking of this bird sold for more than one hundred dollars.

In Australasia the thorny clot-bur (*Xanthium spinosum*), has somehow acquired the local name of "Bathurst burr." It is, in fact, a native of tropical America, and the seeds were probably carried to our antipodes in ballast, or mixed with grain.

A South African publication states that many trees in the government compound at Kimberley have been destroyed by a species of underground ants, which eat into the roots and penetrate upward into the trunk, whereupon the tree slowly withers.

The Italian Committee for the Defense of Agrarian Interests issues a spirited appeal to the agriculturists of Italy to unite in a solemn protest against the enactment of the law for the re-imposition of a two-tenths war tax, which was repealed seven or eight years ago.

Drouths in Algeria are reported to have caused much damage to the geranium crop, which is raised for the purpose of distilling geranium oil from the leaves. The fragrant oil is used by perfumers, a part being sold under its own name, but a still greater amount is used for adulterating the attar of roses.

The importations of eggs into Great Britain continue to increase from year to year. The value of egg imports for 1893 was nearly twenty million dollars. The greater part of the imports were from France, those from Germany and Belgium being next, while Russia and Denmark supplied the remainder.

A peculiar and fatal disease is reported among horses in West Australia, which has mystified the veterinary authorities. The symptoms are drowsiness and hot running water from the eyes, followed by white, watery discharge from the nostrils. Death generally ensues within three or four days from the first attack.

Tobacco culture is increasing rapidly in Queensland, Australia. The crop has been found to be the most profitable one raised in the colony, the local demand from the tobacco factories sustaining good prices for the leaf. Coffee is also receiving increased attention in the colony, and many trees have been planted in the northern districts.

In the Indian provinces of Patna and Shahabad, and still more in the provinces south of the Ganges, maize or Indian corn is an important article of food for the natives. It is said to be prepared and eaten like barley, but frequently the ears are pulled while green, husked and cooked, the natives having learned the secret of "roasting ears."

The display of sugar canes at the recent agricultural exhibition of the island of Mauritius is said to have been the finest ever brought together in one room. More than seventy varieties of cane were shown, including seedlings of all sizes, from the tiny shoot to the full-grown cane twelve feet high, grown in a single season from home-grown seed.

A lecture on agriculture by a native is a quite unexpected indication of awakening from India's lethargy. Yet Calcutta papers report a lecture by Baboo Bepin Behary Ghose, B. A., on "How to start life as an agriculturist," the meeting being presided over by a native, who, at the close of the lecture, proposed a vote of thanks, which was carried unanimously.

The Ameer of Afghanistan, Abdur Rahman Khau, manifests an enlightened interest in horse-breeding. His stud consists of 3,500 mares, 70 thoroughbred, and 10 hackney stallions. To these he has recently added one thoroughbred and four hackney stallions and a Spanish jack. The mares are a mixed lot of several native breeds and imported Australian animals.

The *Capricornian*, an Australian journal, says that "the introduction of the little fruit baskets as used in California; into which the fruit is picked direct, has given a fillip to fruit eating, and growers find it so profitable that neither producer nor consumer will now rest content until the whole of the Californian system of handling fruit has been introduced to South Australia.

A singular instance of connection between superstition and agricultural pests is reported from Ceylon. The high-class Buddhist Cingalese refuse to destroy the predatory insects which infest the tea plantations, as they regard it a sin to take life. Consequently the tea plantations owned by them become the breeding grounds for moths and other insects, and a source of infection to neighboring plantations.

The Madras *Mail* is advocating flower farming and the manufacture of perfumes as peculiarly well adapted to India. It urges that the establishment of scent factories would create a market for great quantities of flowers, of which no use is now made. The *Kanaga odorata*, from which ylang-ylang is made, grows in all parts of Southern India, while roses, jasmines, tuberose and many other fragrant flowers are easily cultivated there.

A series of chemical tests, instituted at the instance of Pomeranian dairy farmers, showed that fully twenty-five per cent. of the butter sold in Berlin was adulterated with margarin. The amount of the admixture ranged from thirty to one hundred per cent. The conclusion was that the loss to German dairy farmers on this account could not be less than ten thousand dollars per day. A movement has been started to procure legislation against the fraud.

A new rust-resisting variety of wheat is reported by the *South Australian Register*. It was observed by a farmer, several years ago, while reaping a badly rusted field of wheat, that among it were some heads wholly unaffected. He picked and carefully saved them, sowing the grain the next year. It yielded well and showed no sign of rust. From that beginning the stock has increased until twenty acres were raised last year, the crop of which was taken at a good price.

More than thirty-seven million acres of land are infested by the rabbit pest in Victoria, Australia. During the last eleven years the colonial government has expended nearly two million dollars in efforts to abate the pest, besides the expenditures of individuals. The rabbits are trapped for their skins, over one hundred and fifty thousand pelts having been purchased monthly in one town. The authorities of some districts have decided to employ phosphorised wheat for the destruction of the rabbits.

The *North British Agriculturist* says: "The Clydesdale Horse Society has fallen upon sadly altered times. The collapse of the Clydesdale exportation trade has reduced to the vanishing point the revenue formerly derived by the society from the issuing of exportation certificates, while, by the same cause, the revenue formerly derived from the entry of stallions has also been immensely reduced. In the end of the 'Eighties' hundreds of colts were registered and kept as stallions for the American market; but now the same class of colts are kept as unregistered geldings, and, sooth to say, they are more valuable as geldings than they had any right to be as second-rate stallions." From which it would appear that "second-class stallions" were the sort "kept for the American market."

The eminent Professor McCall, of Scotland, in a recent lecture on bovine tuberculosis, strongly urged increased vigilance in guarding against infection of the disease. Much more risk to human life, he stated, is entailed by the use of milk and meat of animals infected with tuberculosis than from those affected by pleuro-pneumonia. He expressed the belief, however, that thorough cooking destroyed the bacillus of tuberculosis. He emphatically denounced the sale of milk from affected cows as a means of spreading the disease, especially among infants.

A Dairy Teachers' Union has been organized in England with the following avowed objects: 1. To promote a better system of conducting examinations at dairy schools and judging at butter-making competitions. 2. To keep a register of qualified dairy teachers. 3. To raise the standard of dairy teaching. 4. To formulate a syllabus of instruction suitable for traveling dairy schools. 5. To take such other action from time to time as may be considered calculated to advance the interests of dairy teachers. Nearly all of the teachers in Great Britain are young women.

The Swedish government is very liberal in encouraging the dairy industry and promoting dairy education. In Sweden there are never fewer than fifty-two girls being educated at public expense for dairy work. Of these forty are boarded at coöperative dairy factories under government inspection, the others being maintained at dairy schools as free pupils. One hundred dollars yearly are allowed each pupil for board, lodging and instruction, besides which the pupil receives twelve dollars a year for clothes. The course of instruction extends over a period of two years.

One of the leading crops of the island of Formosa is the oil bean. Two kinds are cultivated, both being related to the soja bean. To extract the oil the beans are first crushed under a great stone wheel ten feet in diameter, which is drawn around by mules in a concentric channel containing the beans. The crushed beans are made into a cake with straw, and the oil is expressed by very primitive appliances. After the oil is extracted, the cakes are taken from the press, the metal bands and straw casings removed, and, after being left to dry for awhile, they are shipped away for manure.

The beet industry is one of the most important branches of agriculture and manufacture in Russia, and beet sugar not only supplies the whole wants of the Russian Empire, but is exported in very considerable quantities to Austria, Germany and other countries. The United States consul general at St. Petersburg says that the cultivation of beets took its rise in Russia at the beginning of the present century simultaneously with its introduction into Western Europe. The Government from the first has taken an exceedingly active interest in this industry, and it has been strongly supported by the several agricultural and economic societies of the empire.

The annual report of the British Board of Agriculture shows the area in Great Britain under all forms of crops, bare, fallow and grass, to be 32,644,000 acres, but beyond that are 12,300,000 acres in mountain and heath used for grazing, 2,695,000 acres of woodland, and 13,000 acres of nurseries. Of the entire cultivated area 85.7 per cent. is farmed by tenants, leaving 14.3 per cent. in the occupation of the owners. The movement toward laying down land to permanent pasture continues, the area of arable land having decreased during the past year by 176,000 acres, most of which was laid down in pasture.

From France it is reported that a movement is on foot to organize a Dairymen's Union in the milk region of Paris—a railway radius of fifty miles around the metropolis. It is proposed to affiliate the local dairy syndicates with the Central Federation of the city, and establish a uniform price for milk, which price may be made lower than the present average. This is to be effected by dispensing with the needless waste of labor in the distribution of milk. The new association is also to obtain for its members dairy cows of the most approved breeds, the Normands and Shorthorns being the leading favorites, with the Ayrshires coming rapidly into favor for milk.

Timely Answers.

Feeble Pot Plants. — Mrs. St. George, Queens Co., N. Y.: From the description given of your palms, amaryllis, and other tender plants, we are inclined to think that they are given too large pots, and perhaps too much water, while they have been in a half dormant condition. It seems to be quite a general idea, as well as fault, among amateur cultivators of house plants, that the more pot room, the better to secure rapid and vigorous growth, when, in fact, a little crowding of the roots is the safest plan. When the pots become filled with roots, forming a nearly solid ball, the plants may be shifted into a larger size, but in no case should there be more than room enough in new pots to allow one inch of fresh soil between the ball of roots and sides of the pot. When the roots have again filled these pots, shift to a size larger. If you will turn out your sickly plants and shake off the old soil, you will probably find that they can be re-potted into much smaller sized pots than those in which they are now growing, and will be all the better for the change.

Training Sheldon Pear Trees.—L. C. C., Lackawanna Co., Pa.: It is the habit of the Sheldon pear tree to grow very upright, so much so that the head becomes altogether too dense unless it be continually thinned. Where you have but one or two trees, you can make them more spreading by forcing out the limbs, using a crotched stick for the purpose, covering its ends with a woolen rag in order to prevent rubbing off the bark. You can also help the matter by always leaving the last bud on a pruned limb, on the outside, so that the growth will be away from the top or center. It is rather a difficult tree to manage.

PAINT cracks.—It often costs more to prepare a house for repainting that has been painted in the first place with cheap ready-mixed paints, than it would to have painted it twice with strictly pure white lead, ground in pure linseed oil,

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forms a permanent base for repainting and never has to be burned or scraped off on account of scaling or cracking. It is always smooth and clean. To be sure of getting strictly pure white lead, purchase any of the following brands:

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"JEWETT" (New York).
"KENTUCKY" (Louisville).
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"MISSOURI" (St. Louis).
"RED SEAL" (St. Louis).
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ANIMAL AILMENTS.

Lampas.—"A Subscriber," Philadelphia, Pa., desires to know how to cure lampas in a colt. The age of the colt is not given, and the trouble is probably teething. If so, a handful of shelled corn, followed by a bran mash, to which linseed meal is added, will soon relieve the irritation of the gums. True lampas consists of inflammation and swelling of ridges of fleshy bars in the roof of the mouth. Overfeeding of aged horses produces a fever of the mouth, resulting in lampas. Burning, which is common with blacksmiths, is a cruel practice, that kindles rather than allays inflammation. If there is much tenderness and swelling, the bars affected may be scarified with a clean, sharp knife, which will give relief after a few days' feeding with bran and linseed meal mashes. It is not necessary to cut deep gashes lengthwise of the inflamed bars, but just into the mucous membrane, to relieve the superficial blood vessels. It is rarely necessary to give laxatives to horses for this trouble. If the animal is constipated and feverish, half a pint of linseed oil mixed with the mash will secure the desired result.

Thoose or Thusk.—James O'Connor, Pike Co., Ala., has a choice Jersey calf that has what he believes to be worms in the windpipe. This is caused by a parasite, *Strongylus micrurus*, in the trachea or bronchial tubes. It generally occurs in calves and lambs, in hot, dry summers. It causes a good deal of irritation, and a distressing, persistent cough. The animal loses flesh and becomes puny. The parasite is like little white ends of threads, sometimes scattered, but generally in groups, in the upper air passages. Though these cause great distress, yet a tablespoonful of spirits of turpentine, given two or three times a week, will dislodge them. Chlorine gas will do the same, but is not so convenient.

Mange.—Michael Larkin, Decatur Co., Ind., has a dog, a horse, a cow, and possibly a pet lamb that sleeps with the dog in the kennel, affected with mange. There are several kinds of acarida. The psoropes, or dermatodectes, affect the body, and the chorioptes the limbs of horses, commonly called grease. These also are found on cattle; and the sarcoptes and both of the others are found on sheep. The dog also harbors the sarcoptes and the *Dermodox folliculorum*, which produces the bare spots because of its habitat in the hair follicles. Isolate infected animals, and cleanse and disinfect with carbolic acid, or corrosive sublimate solutions, all clothing, harness, stables, rubbing posts, or kennels. Hot water and soft soap should be used unsparingly in washing infected places, and, after thoroughly fumigating with sulphur, a similar washing with soft soap and hot water all spots affected on all animals. Then, should there be sores or scabs, apply sulphur iodide ointment or mercuric nitrate ointment. Palm oil makes a good application to hardened scabs. The itch spots, after washing, should be dressed with the ointment and left for three or four days, and then the same process must again be repeated till cured.

Crick-Back—Jerk Back—Shivers.—Irving Slade, Henderson Co., Tenn., writes to learn if there is a disease bearing the above names. It is an affection of the brain or spinal cord. The animal, when suddenly frightened or compelled to back, is immediately seized with a nervous paroxysm that causes strange contortions. The animal is thrown upon its haunches, the fore limbs advanced, the head raised, the nose extended, and the tail switched up and down, as in tetanus. The case is incurable, as it is probably caused by tumors of the brain or spinal cord.

Foot-Rot of Sheep.—David Teller, Grand Forks Co., Dakota, has had a small flock of sheep in a damp yard, and finds that several are lame. "Presuming that it is foot-rot, I wish to know the best treatment through your valuable paper." This is an inflammation and abscess of the sensitive structure of the foot connected with the hoof. It is caused by the filth and dirt working under the edge of the hoof. It may be that some micro-organism is at the root of the evil. Remove your lame sheep from the damp and filthy run to a dry floor, well littered with dry straw, and freely sprinkled with chloride of lime. As it is of the first importance to keep the feet dry and clean, the floor should slope, or the boards be not placed too close, so that the urine can freely run off. The feet must be washed with hot soap and water, the loose horn of the hoof must be cut away, and when clean, dressed with tow, moistened with carbolic acid, and secured by a figure eight bandage between the clefts. The following may be applied from a bottle having a cork perforated with a quill, as pepper sauce is dashed on meat, and then dress as above: Sulphate of zinc three-fourths ounce, sugar of lead one ounce, tincture of myrrh two ounces, soft water one quart. Daily care must be taken of the cases. If offensive, a ten per cent. solution of carbolic acid may be added to the dressing.

Jaundice.—Isaac Kaufmann, Kaufman Co., Tex., states that he has had jaundice in horses, cattle and sheep on his farm, and would like to know the cause. None of his animals have died, so the supposition is natural that no serious disease of the liver existed in any of his animals. Organic disease of the liver, like cancer, tuberculosis, or flukes, would produce an incurable jaundice. But in the human subject and in animals, functional derangements of the liver would cause yellowness of the eye and skin. Malaria affecting both man and animals will cause jaundice. In such cases large doses of calomel and castor oil, acting strongly on the sluggish liver, will give relief. But even these remedies require to be repeated to set the wheels of health in normal motion. It is probable that malaria may be the cause. This may lurk almost everywhere; on high ground, even, where rock or hardpan lies near the surface, malaria is common, for the conditions are similar to swampy sections, where rapid vegetable decomposition exists. Jaundice is invariably attended by constipation, indicating suppressed secretion of bile, non-elimination, or re-absorption. The usual remedies for horses thus affected are aloes, calomel, iodide of potassium, podophyllin, ox gall; for cattle and sheep castor oil, linseed oil, glauber salts, followed by iron, quinine, or arsenic, with a digestible and laxative diet. In your cases probably housing at night and leaving the animals indoors till the dew is off the ground, and especially in rainy, foggy weather, with cold winds, will be sufficient.

Disease of the Spleen and Pancreas.—L. C. Benson, Rutland Co., Vt.: Domestic animals are less liable to disease of these organs than man, and in them—except malaria—the diseases are malignant or incurable; as hydatids, tubercle, cancer, ossification or fatty degeneration. It is common to find enlargements of these organs in our domestic animals when slaughtered for food. Abscesses of the liver in fowls is frequent. The liver is often softened in young calves, causing colic and diarrhea in those eating such organs.

Blindness in Calf.—A subscriber in Burleson Co., Tex., has fed cotton-seed meal and cotton-seed hulls to a young calf so freely and so concentrated that it caused blindness. The eyes have turned to a peacock green color. We advise a total change of food—milk, linseed tea, and cut and moistened hay, as the calf will not eat grass—previously giving eight ounces of castor oil, to remove the irritation of the cotton-seed hulls and the too stimulating feed. If this does not relieve the sight, we advise fattening on milk, with two or three eggs beat up in each meal, three times a day till fat.

Inflammation of Liver.—W. R. Yam, Hill Co., Oregon, lost a seven weeks' old calf from inflammation of the liver and small intestines, from improper feeding. The gradual substitution of sweet milk for skim milk, leaves too much casein and too little fat, if not corrected by linseed-meal tea. It is probable that this calf drank the skim milk too fast so that the cheese was not digested, being coagulated in insoluble masses in the fourth or true stomach. If a calf is worth raising it should be fed on good milk at first, very gradually adding linseed meal. The true stomach of young calves directly receive and digest the milk. The other stomachs gradually develop.

Glanders.—A subscriber on Long Island, N. Y., purchased a city horse said to have the distemper. The horse was kept in an outbuilding by himself, as he suspected glanders. He wishes to know how to tell glanders. Fever is the first stage of glanders. It is a contagious, malignant and fatal disease, liable to attack man, and is recognized by ulceration, and red knots or bunches in the nose. This is glanders, while if the nodules are in the skin, it is termed farcy. It is caused by a bacillus or micro-organism capable of being carried to horses or to man by contagion or inoculation. These nodules break down and form digusting ulcers in the nose, and, when in the skin, they form abscesses that do not heal. The disease may be slow or chronic, or active or acute. The disease appears three or four days after exposure or inoculation. In the slow form there is fever, debility, attended with a broken-down condition, with a filthy state of the nose. There is no effectual treatment for the disease and very properly the law requires the immediate destruction of the horse, its deep burial, and thorough cleansing and disinfection of the stable, pails and all utensils used about the affected horse. Send for a veterinarian.

Sore Fetlocks in Horses.—Thomas Silver, Anderson Co., Ky., has a horse that has red and tender fetlocks on the hind feet from traveling in snow water where salt was used on a railroad to get rid of the snow. Has tried ointments, but it is so tender that it makes the horse lame when first taken out of the stable. The part seems thickened. After washing at night, apply a mixture of soap liniment four ounces and a dram of carbolic acid. Moisten lint or tow and bind on snugly with a smooth bandage. The application of equal parts of tincture of iodine and glycerin every two or three days.

Indigestion of Colt.—John Cartwright, Ashtabula Co., Ohio, has a two-year-old colt that looks and acts dull, has a rough coat, feeds badly and does not grow. The trouble is indigestion. Get, at the druggists, four balls made of the following for each: Two drams of powdered aloes, one dram of powdered ginger, and mix with soft soap to form a ball, and give one every third night, giving a small bran mash after the ball. Keep everything clean, give pure water, let the colt run to pasture in the day, and stable at night. Give, night and morning, a feed of crushed oats and bran or wheat middlings, with a handful of whole flaxseed.

Louping Ill in Sheep.—P. R. Spring, Brown Co., Ill.: This is a nervous affection in sheep, cattle and horses. The pathology is not yet certain, but, so far as known, it is attended with dropsy of the spinal cord. So far as cure is concerned, the prognosis is doubtful. But it is certain that all animals, and especially sheep, do not do well on wet, cold pastures. They suffer from malaria, which produces enlargement of the spleen, besides deranging the animal functions.

Diarrhœa in Flock of Sheep.—Philo Sturgis, Jefferson Co., Miss., has a small flock of sheep that have diarrhœa every time they are turned in a low, wet pasture. There are probably some laxative or cathartic plants that grow in the pasture that produce the diarrhœa. Watery young grasses have a loosening tendency. Shut up the flock at night on dry hay and bran, and add a teaspoonful of sulphate of iron to the water for each sheep. Change the pasture, and, if possible, drain the wet field.

Milk Fever—Parturient Fever.—L. D. Stowell, Orange Co., N. Y., has been successful in treating cows having fever after calving by hot drinks, and blankets wrung out in hot water, covering the whole body except the head. Where the fever is high, thirty drops of tincture of aconite every three hours, for three doses, will give relief promptly. A teaspoonful of carbolic acid in four quarts of warm water as an injection will prevent septic poisoning. Give freely of water with an ounce of sulphite of soda to the pailful.

Impaired Digestion in Horses.—J. Corig, Fairfield Co., Conn., has a Kentucky bred saddle mare that has been neglected, and he finds that she does not feed nor look so well as formerly, having had but little exercise or grooming. No horse can be healthy without an average of three or four hours exercise daily; and a horse accustomed to thorough grooming is liable to impairment of appetite and vigor if the skin is not regularly cleansed. Give daily exercise. Put the mare to regular work and give the following powder with each feed: Saccharated carbonate of iron two drams, powdered gentian half an ounce. Mix this with the feed. Too much hay makes a horse rough and big bellied. A lump of rock salt should always be kept in the feed manger.

Southern Cattle Fever.

The United States Secretary of Agriculture has defined the portions of the United States infected with the Texas, splenetic or Southern cattle fever as being nearly all of Texas, all of the Indian Territory, nearly all of Arkansas, all of Mississippi, Alabama, Georgia, Florida, South Carolina, and all of North Carolina and Old Virginia, excepting only the Blue Ridge counties. From the middle of February to December of this year, no cattle are to be transported from said area to any portion of the United States which is north or west of this infected region, except by rail for immediate slaughter, and when so transported, certain regulations are to be observed.

When any cattle, in course of transportation from the Southern fever area, are unloaded at the north or west, to be fed or watered, the places where such cattle are to be so fed and watered shall be set apart, and no other cattle shall be admitted thereto. On unloading such cattle at their points of destination, pens shall be set apart to receive them, to which no other cattle shall be admitted. The regulations relating to the movements of Southern cattle prescribed by the cattle sanitary officers of the State where unloaded, shall be carefully observed. The cars that have carried said stock shall be cleansed and disinfected before they are again used to transport, store, or shelter animals or merchandise.

All cars carrying cattle from the infected area shall bear placards stating that said cars contain Southern cattle, and each of the way-bills of said shipments shall have a note upon its face with a similar statement. Whenever any cattle have come from said area, and shall be reshipped from any point at which they have been unloaded to other points of destination, the cars carrying said animals shall bear similar placards, with like statements, and the way-bills be so stamped. At whatever point these cattle shall be unloaded, they shall be placed in separate pens, to which no other cattle shall be admitted.

The cars used to transport such Southern cattle, and the pens in which they are fed and watered, and the pens set apart for their reception at points of destination, shall be disinfected as follows: All litter and manure are to be removed. This litter and manure may be disinfected by mixing with lime or diluted sulphuric acid. If not disinfected, it may be stored where no cattle can come in contact with it until December. Wash the cars and the feeding and watering troughs with water until clean. Saturate the walls and floors of the cars, the fencing, the troughs, and the chutes of the pens, with a solution made by dissolving four ounces of chloride of lime in each gallon of water. The cars may be disinfected with a jet of steam, under a pressure of not less than fifty pounds to the square inch. The yearly losses resulting from the contraction of this disease by exposure in unclean and infected cars and pens, and by means of the manure carried in unclean cars, have become a matter of grave concern to the cattle industry of the nation. It is absolutely essential that healthy cattle should be protected as far as possible by separating the dangerous cattle, and the adoption of efficient methods of disinfection.

Singular Behavior of the Shaffer Raspberry.—E. G. F., Orange Co., N. Y., writes us: The Shaffer raspberry has not behaved well in my garden for the past three years. I have tried pinching them back in the summer time and have also allowed them to grow, doing all the pruning necessary in the fall or spring. A large part of the canes die in spite of all my care. They split open and the bark often peels off. They have given me a scant crop only. Side by side with them I have the Golden Queen and the Columbian. Both of these, at this writing, April 20th, are all budded out, while the Shaffer shows no sign of life.

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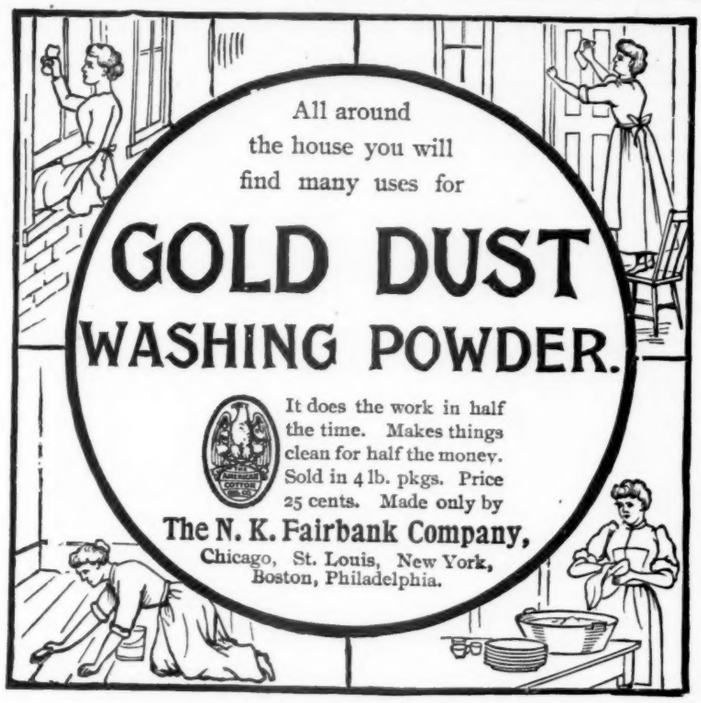
Considering the quick cultivation, varied productions of high quality, and practically no time from the great markets of Chicago, Milwaukee, Detroit, etc., are in the famous fruit belt of Michigan, along the eastern shore of Lake Michigan. A populated region with schools, churches, railroads, steamboat lines, telegraphs. Millions of people to buy all fruit, vegetables, garden truck as fast as it grows, and transportation ready, quick and cheap enough to get it to them. $5 to $20 per acre. Write to B. F. Popple, G. E. Agt. C. & W. M. R'y, 375 B'way, New York, or West Mich. Land Co., Muskegon, Mich. Mention this paper.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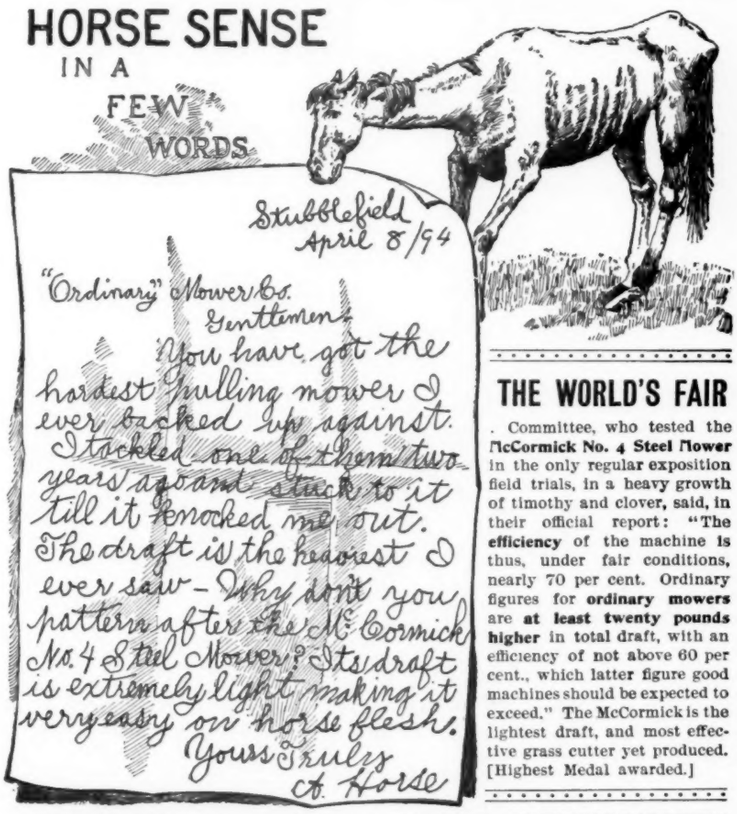
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Yours Truly
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Committee, who tested the **McCormick No. 4 Steel Mower** in the only regular exposition field trials, in a heavy growth of timothy and clover, said, in their official report: "The **efficiency** of the machine is thus, under fair conditions, nearly 70 per cent. Ordinary figures for **ordinary mowers** are **at least twenty pounds higher** in total draft, with an efficiency of not above 60 per cent., which latter figure good machines should be expected to exceed." The McCormick is the lightest draft, and most effective grass cutter yet produced. [Highest Medal awarded.]

McCormick Binders, Reapers and Mowers are built by the McCORMICK HARVESTING MACHINE CO., CHICAGO, and are for sale wherever grain or grass is grown.

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The Future of Wheat Growing.

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Extravagant Claims.—Statements to the effect that the lands suitable for wheat culture in North America alone are more than sufficient to double the present product; that every farmer knows that the present product might be doubled without adding a single acre; that some farmers raise three times an average of twelve bushels an acre, and that all may; that in the Northwestern Provinces of Canada exists a region but just touched with the plow capable of producing 2,000,000,000 bushels, which is about the whole product of the world; that the undeveloped fields of Africa, Australasia and South America will yield great quantities of the best quality of wheat; that two years ago no one thought of Argentina as a wheat exporting country; that Argentina last year exported 20,000,000 as a beginning, and this year expects an exportable surplus of 50,000,000 bushels; that in Argentina wheat is grown at a profit at 25 cents a bushel; that 25 cents is also about the cost in the Dakotas and Manitoba; that the wheat of Argentina can be laid down in England for 50 cents a bushel; that the American farmer must and can compete with foreign growers at this price; that the yield may be made to reach forty bushels an acre for the United States, and that a view bounded by 25 cent wheat is the one which the American farmer must consider.

Farmers, Don't be Scared.—It would be difficult to make a greater number of fallacious and misleading and mischievous statements in the space of a half column article than those paraphrased above; and this is the feast of Dead-Sea fruit to which the writer invites all the farmers of the United States. As one of the invited partakers of this delectable feast, I desire to know what warrant there is for the least of these averments put forth by a contributor in the AMERICAN AGRICULTURIST for May, with a confidence that should be inspired by a complete knowledge of the facts.

The Real Facts.—I have been at much pains to investigate the facts in relation to wheat growing, and I find that there are the most abundant reasons for believing that the American farmer will never be called upon to compete with wheat that costs but 25 cents; one all-sufficient reason being that wheat cannot be grown at this price and has not for centuries over the whole of any wheat producing country; that there is not the slightest probability of any American farmer having to sell his wheat on the basis of fifty cents in England; that there are no more considerable areas of wheat land to bring under cultivation in the United States; that we are, and have been for some years, annually diverting wheat fields to the production of forage—oats and hay—required by the 1,500,000 yearly added to the home population; that the wheat area of the United States, if we can rely either upon the Census or the reports of the Department of Agriculture, is very much less now than in 1884; that the corn area is nearly 6,300,000 acres less than in 1889; that the annual additions to the population require the product of at least 3,300,000 acres in corn, oats and hay; that the hay acreage alone yearly absorbs more acres than are yearly reduced to cultivation; that additions to the corn and oat fields can only be made by drafts upon the lands now employed in growing wheat for export; that more than 90 per cent. of all additions to the population are centering in the urban districts and becoming customers of the farmer, and that few new farms are being added, by reason of the practical exhaustion of the arable lands which few now question, although I was written down for a crank when I first directed attention to the fact less than five years ago.

Our Waning Area of Wheat.—There are probably few men in the United States better informed as to agricultural conditions, especially in the great Central West, than Mr. Eugene V. Smalley, who, in the April *Forum*, summarizes the situation by saying that:

"We can fill up the eastern parts of the Dakotas, where the population is still scant, and then we shall have done with any important increase of our wheat acreage. Kansas and Nebraska are already settled as far west as rainfall warrants tillage. I do not take into account the strip of wonderfully fertile country in Eastern Washington and Northern Idaho, because that is already better settled than either of the Dakotas. We shall have no new agricultural States, and no very great increase of the food producing areas in the older States."

Canadian Competition.—There is a productive region of limited extent in Manitoba, but quite as fully occupied as the Dakotas, while wheat growing in the other Provinces of Northwestern Canada is, and is ever likely to remain, an extra hazardous business because of destructive frosts that ruin the hopes of the farmer one year out of three, and even this much of success is questionable, as the meteorological data are not such as to show clearly how far North wheat can be grown at all. At most, the area possibly adapted to wheat growing does not exceed the area of the Dakotas, and nothing could well be more preposterous than to

(*Continued on Page* 355.)

Given High Honors.

The World's Columbian Exposition, though now only a glorious memory, has left lasting monuments behind. For generations to come its impartial awards will be the basis of determining the comparative merit of the things judged. Few, if any, of the thousands of exhibitors at the fair were more highly honored than William Deering & Co., of Chicago, the world's largest manufacturers of harvesting machinery. Of the total number of twenty-six awards given to the seventeen exhibitors of harvesting machinery and binder twine, this firm was given sixteen awards—sixteen medals and sixteen diplomas. The other ten awards were distributed among four other exhibitors, the highest of these receiving six awards, another two, and two others one each.

This supremacy was given to the Deering machines simply because they outclassed all competitors in their records of draft and efficiency as tested in competitive field trials.

Deering machines were given exacting official field trials in Colorado conducted by the regular judges of farm machinery, appointed and paid by the government. These trials were on irrigated farms where the growth was rank and the land strewn with stones and gridironed with irrigating ditches and laterals. Notwithstanding these adverse conditions the Deering Improved Steel Binder made a draft record 14.3 per cent less, and the Deering Pony Binder 16.9 per cent less than the records made for a competing binder in straight grain on smooth ground at Wayne, Ill. Similarly, the Deering 5-foot Ideal Mower showed a draft 38.8 per cent lower than the 5-foot mower tried at Wayne; and the New Deering 5-foot Mower 19.5 per cent lower. The Deering Giant Mower showed a saving of 23.7 per cent over a competing mower of the same size in the Wayne trial.

This remarkable saving in draft made a strong impression on the judges, who could not help realizing its great importance to agriculture. The noval feature of the Jointed Platform, coupled with the simplicity of the binding attachment and the marked efficiency and evident strength of the whole machine, were all taken into account by the judges in giving their awards for the binders.

In considering the mowers the judges were strongly impressed with the unique adjustable drag bar, the two-piece pitman, the everlasting gears, and the perfection of mechanism, which enable these machines to do better work for more years with lighter draft than any other mowers made.

Manufacturers of harvesting machinery and binder twine were especially fortunate in the high character and wide experience of the judges appointed to examine their exhibits. They were Prof. John E. Sweet, for years Professor of Mechanics in Cornell University at Ithaca, N. Y., who is recognized as being one of the greatest authorities on mechanical matters in the United States, Hon. Hiram C. Wheeler of Odebolt, Iowa, one of the largest farmers in that State, who was republican candidate for Governor of Iowa in 1891; and Mr. Charles Whitney of Illinois, an inventor and mechanical expert of wide reputation.

One of the great events of the exposition which, though having no bearing on the award of prizes, gave Deering machines honors considered by many as even higher than the actual award of prizes, was the famous tour of the Foreign Commissioners to the bonanza farms of North Dakota. The results of this tour, together with a description of the Deering machines, are set forth in a beautiful book entitled "Why Bonanza Farming Pays," which is sent free on application by William Deering & Co., to all farmers desiring it.

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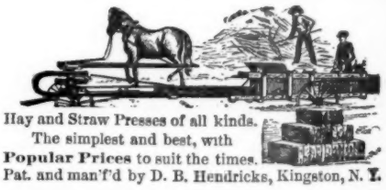
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The Future of Wheat Growing.

(*Continued From Page* 354.)

talk glibly of the ability of that region to produce 2,000,000,000 bushels of wheat, or even a tenth of it, as there is nothing, as yet, to show the adaptability of any considerable part of that country, outside of Manitoba, to wheat growing, and at most it can never exceed the power of the one State of Kansas in that direction.

Increased Yields Per Acre. — The statements that the product of the United States may be doubled by improved processes, and that because one man with soil of the highest fertility and favorable climatic conditions has grown forty bushels of wheat, all may, are too ridiculous for serious consideration, and show an entire misconception of the conditions surrounding wheat culture which, here, as elsewhere, are more a matter of climate than tillage or of soil. I have raised 45 bushels an acre on rich creek bottom, but if my upland neighbor had tried to secure such a yield, it would have cost him more than the legendary two dollars a bushel for fertilizers; and then he must reckon with climatic conditions. The land that gave me 45 bushels one year failed to return the seed the next time it was in wheat. In 1892, Kansas grew 71,000,000 bushels, and in 1893 only 23,000,000, although more wheat was sown for the latter harvest than for the former. — Climatic conditions.

Australasia has 200,000 acres less under wheat in 1893 than in 1887, because the growers, although getting more for their grain than Kansas and Dakota farmers, find it unprofitable; and much land being occupied under long term pastoral leases, but little expansion of the wheat area is possible for years. Even then there is no such expansion possible as will materially affect the world's markets.

Africa as a Wheat Grower.—Outside the Boer republics, Africa contains no considerable areas adapted to wheat growing, and even there the whole possible area does not exceed that of one of the Dakotas. Cape Colony has been settled hundreds of years, and yet it still imports a fourth of its breadstuffs and will continue to, as but little of the area is adapted to wheat. Wherever the banana ripens wheat will not, and this is conclusive as to nearly all Africa north of the Dutch republics.

Truth About Argentina. — The statement is made that the unoccupied areas of Argentina will alone suffice to furnish all the wheat required, the area adapted to wheat being placed at 240,000,000 acres. These statements will not bear the least scrutiny. There are but 240,000,000 acres in the whole of Argentina that the most enthusiastic "boomer" of that country of collapsed booms has ever claimed was adapted to any kind of cereals. This estimate was first made by a Mr. Fliess, and is of such a character that the British Minister to Argentina cautions Lord Roseberry against placing confidence in its accuracy, designating the estimates of the cereal area as exaggerated.

The facts are that three-fourths of Argentina have a rainfall ranging from nil to only sixteen inches annually; that there are about 200,000,000 acres adapted to grain culture; that 100,000,000 acres, or one-half the cereal area, is within the region of tropical rains and fit only for corn; that of the fourteen provinces of Argentina only Buenos Ayres, Entre Rios, one-half of Cordova and a third of Santa Fe, are in any degree adapted to wheat growing; that even the southern 200 miles of this area is subject to destructive frosts; that the whole wheat area only equals two such States as Kansas; that locust invasions are of almost yearly occurrence, and while very destructive to the corn crop, yet rarely come in time to damage the wheat; that the whole wheat belt has a climate as capricious as that of Kansas, and destructive drouths are common, and that Argentina did not begin wheat exportation last year, as 780,000 bushels were exported in 1879; that the exports of 1887 aggregated 9,000,000 bushels, as those of 1890 aggregated 12,500,000 bushels, while the exports of 1893 were some 33,000,000 bushels instead of the stated 20,000,000.

A World's View. — We had two phenomenal crops in 1891 and 1892, and Argentina had equally as phenomenal acreage yields in 1892 and 1893, and while there is annually a material percentage added to the acreage of Argentina, it does equal one-third the additions yearly made to the world's wheat requirements. The additions made to the wheat areas of Argentina, Uruguay and the Balkan States have long been offset by reductions in Western Europe and the United States. This is made manifest by the incontestible fact that the wheat acreage of the world in 1893 was but 100,000 acres, or barely five-hundredths of one per cent. greater than in 1884, while in 1894 it is probably one or two million acres less than ten years since, because of reductions in the United States that exceed the additions made elsewhere.

Wheat is Low because the world had a surplus acreage of quite 9,000,000 in 1880, permitting the accumulation of great stores from the extraordinary crops of 1882 and 1884 that sufficed, with the product of an acreage that continued in excess up until 1887, to carry the world safely to the end of the 1890-91 harvest year, when consumption had overtaken production and remunerative prices would then have come to stay, but for the enormous acreage yields of the fields of the United States in 1891 and 1892—yields that enabled us to throw upon the world's markets at least 370 million more bushels than we could had those crops been but average ones. The world's crops of 1891 and 1892 were 369,000,000 bushels in excess of the two preceding ones; the excess being nearly in the measure of our extraordinary contributions to the world's supplies.

When Prices May Advance. — But for the extraordinary acreage yields from American fields in 1891 and 1892, the acreage deficit in the world's wheat area, now equaling 16,000,000 acres, would long since have brought good prices for wheat and carried up the prices of all other grain, as the bread-eating peoples have increased 60,000,000 since the world's wheat area ceased to expand. Moreover, the world's area under all grains of the temperate zones has increased but 12,200,000 acres in ten years, while the increase of population indicates an increase of nearly six times that amount. In other words, the bread-eating populations have, since 1884, increased more than five times as fast as the food-producing areas, and but for an excessive acreage in 1884, scarcity and high prices would have long since ensued.

A Brighter Future Ahead.—The farmer is certainly entitled to all the encouragement that can be drawn from these facts, and there is no excuse for any writer drawing upon his imagination for material with which to paint the future in somber hues, especially when, even if the alleged wheat lands were existent, it would take decades to bring them under cultivation, while ten years will add acreage requirements of not less than 29,000,000 acres, to which must be added an existing deficit of 16,000,000 acres.

The future of the farmer is bright and hopeful, and with two crops not above the average in yield per acre, the better prices will materialize.

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THE MARKET PROSPECTS.

The Outlook for Wool.

It is not quite as bad as has been painted. In the first place, it is well to note that the world will continue to use an increasing quantity of wool. In thirty-two years ended with 1892, the United States increased its production of wool only 388%, while its consumption of wool gained 415%. In the last two years of this period, our production gained 6½%, and our consumption of wool over 16%. Wool manufacturing is all upset just now by tariff uncertainty, but stocks of woolen goods are low, and prices of wool have for months been on a free-trade basis. The conclusion is irresistible, that manufacturers will be kept extra busy when times do start up, and it seems as though prices must then improve.

Better Prices for Wool depend both on the supply and on the demand, or condition of the manufacturing industry. The latter cause has depressed prices of domestic wool in the United States far more than the supply, during the last year. Our imports of wool have been only about one-quarter as much in the nine months ended January, 1894, as in the corresponding period of the year before. But many of our factories have been shut or on short time. Hence an average decline in the value of domestic wool at Boston and New York of about 20 per cent. since July last, while Australian wool has declined only about half as much in the London market during the same time, and English wools have held their own, as the following exhibit shows:

THE COURSE OF WOOL PRICES RECENTLY.

1—Washed clothing, Ohio fleece, X and XX, price per pound at New York city, first week in each month.
2—Washed clothing, Ohio medium, ¼ to ⅜ blood; price at New York.
3—Unwashed Kentucky and Indiana, ¼ to ⅜ blood; at New York.
4—Montana fine medium, on the basis of scoured wools, at New York.
5—Wyoming and Utah fine medium, scoured basis, at New York.
6—Average import value of the wool (Class 1) most largely imported with the United States.
7—Price in the London market at first of each month of Southdown wool produced in England.
8—London price of New South Wales greasy or unwashed wools.

[Quotations in cents per pound.]

	1	2	3	4	5	6	7	8
July, 1893,	24	27	21	46	45	9.5	22	16
August,	24	27	21	39	37	9.3	22	15
September,	23	25	20	37	35	8.9	22	15
October,	23	25	20	35	33	10.2	22	15
November,	23	25	19	35	33	10.3	22	15
December,	23	24	19	36	33	11.0	22	15
January, 1894,	23	24	19	35	33	9.7	22	15
February,	22	23	19	35	33	9.6	22	14
March,	21	23	19	35	33	?	22	15
April,	21	23	19	35	33	?	22	14
May,	22	24	20	35	33	?	22	15

The Actual Decline in wool values to the American grower has doubtless been much greater than 20 per cent. Even with free trade—and it remains to be seen whether the Wilson tariff is to be enacted—Australian wool at 15 cents in London must cost 18 cents to the American manufacturer. With only the slightest improvement in business, prices would advance so that here again we find no ground for a further decline even with free wool. And the advocates of free wool are very positive that their policy will be better on general principles.

The Reduced Supply of Wool is notable. In nine months ended April 1st, United States imports of wool were less by nearly 100,000,000 pounds than in the like period of the previous year. All estimates agree that our domestic clip was at least 30,000,000 pounds less in '94 than the year before. The prospect is that we shall enter upon July 1st with receipts of foreign and domestic wools less by 150,000,000 pounds than the supply of the previous twelve months. Even with the paralysis of manufacturing, consumption is not one-third less, so that apparently the supply of wool in the United States has not for years been as light at this date as it is to-day.

Nor has Europe a correspondingly increased supply. Her stocks on January 1st last were only 50,000 bales more than a year previous.

The Clip of 1894 is certain to be considerably less than last year, because of a large decrease in numbers of sheep and poorer care. The commercial estimate of 364,000,000 pounds of wool as the United States '93 clip, was based on 7½ pounds per head on the number of sheep returned by the Department. On the same basis, the clip of 1894, would be about 330,000,000 pounds, but good judges see no grounds for expecting over 300,000,000 pounds of American wool this year.

The great drouths that prevailed in recent years over large areas of Australasia, must seriously interfere with anything like the tremendous annual increase in the wool crop of that region. New South Wales returned only 55,000,000 sheep in '92, or ten per cent. less than the year before. The Argentine Republic may show a larger proportionate increase in her exportable surplus of wool for 1894-5 than any other nation.

We Have Struck Hardpan in the sheep and wool industry, so far as prices are concerned. At least it looks that way. The AMERICAN AGRICULTURIST cannot foretell the future and won't try to, but the prospect looks better for sheep than it did a year ago. The slight gain in values during the past six weeks is another encouraging sign, though the market is still dull.

High Prices for Hay are among the pleasant possibilities for 1894. Drouth has greatly reduced the yield of barley and oat hay in California, and prices have been lately about twice as high as usual, or $16 a ton or more for these grades. The comparatively dry months of March and April, over the grass-growing regions east of the Rocky Mountains, were not conducive to a thrifty start for the grass crop. Unless these regions have an abundance of rain from May 15 to June 15, a serious shortage in the hay crop of the United States is likely to occur. The prospect is better in Ontario and Quebec, Canada. Advices from England and Europe show that the promise of the hay crop in those countries is nothing extra, and that with a total absence of any reserve stocks, the European demand for hay will be quite large. Freight rates from American to English and Continental ports are from $6 to $10 per long ton, while the charges make the cost of selling American hay in those markets from $8 to $12 per ton at least. Experience during the past year shows that the export trade in hay is an unsatisfactory dependence, and the home market is our main reliance. Highest market quotations for the best grades of hay were in May as follows: Boston, Worcester, Providence, New York and San Francisco $17 per ton of 2,000 pounds, Jersey City $18, Philadelphia and Jacksonville $16, Minneapolis and Omaha $7, Chi-

(*Continued on Page 357.*)

$5,000,000 Tobacco Bill Saved.

CHICAGO, [Special.]—The Chicago Inter Ocean's Illustrated Supplement, describing the great success and merit of NO-TO-BAC, has made it famous in a day.

Mr. H. L. Kramer, the active man, was seen today at his office, 45 Randolph St., and in talking of NO-TO-BAC'S growth, said it was hard work to keep up with the rapidly increasing demand, as every box sold advertised NO-TO-BAC'S merit.

He said, "NO-TO-BAC is not sold on the strength of the thousands and tens of thousands of testimonial statements, but under an absolute guarantee to cure, or money refunded." That made a long story about merit very short, as it absolutely protects the user from physical injury or financial loss. "Why," said he, "NO-TO-BAC will make 100,000 cures this year, and the saving will average $50.00 for everyone cured, or a grand total of $5,000,000 saved from going up in smoke and out in spit." NO-TO-BAC is indeed a God-send to the poor man these hard times. According to the testimonials, however, the money saving is the least consideration, for almost everyone reports an improvement of the nervous system, increase in weight, and a revival of physical and mental powers that is indeed miraculous.

Prominent physicians look upon NO-TO-BAC as a great success, and are very free to prescribe it.

Every wholesale drug house in this country and Canada sells NO-TO-BAC, and the retail druggists are pushed to supply the demands of customers; the direct mail demand is immense.

The cost of NO-TO-BAC compared with the results is a small matter, as the saving in a week pays the cost of a cure for a life-time. NO-TO-BAC is sold for $1.00 a box, or three boxes $2.50, with a guarantee to cure, or money refunded.

A few extra copies of the Inter Ocean Supplement (8 pages) illustrated in five colors have been secured and will be mailed for the asking, by addressing The Sterling Remedy Co., Chicago office, 45 Randolph St., New York office, 10 Spruce St., Laboratory, Indiana Mineral Springs, Ind.

WELCOME WORDS TO WOMEN.

Many times women call on their family physicians, suffering, as they imagine, one from dyspepsia, another from heart disease, another from liver or kidney disease, another with pain here or there, and in this way they all present to their easy-going doctor, separate diseases, for which he prescribes, assuming them to be such, when, in reality, they are all only *symptoms* caused by some womb disorder. The suffering patient gets no better, but probably worse, by reason of the delay, wrong treatment and consequent complications. A proper medicine, like Dr. Pierce's Favorite Prescription, *directed to the cause* would have promptly cured the disease.

Mrs. HARRY TAPPAN, of *Reynolds, Jefferson Co., Neb.*, writes: "For two years I was a sufferer. A part of this time had to be carried from my bed. Was racked with pain, had hysteria, was very nervous, no appetite and completely discouraged. A few bottles of 'Favorite Prescription' effected a perfect cure." Sold by all dealers in medicines.

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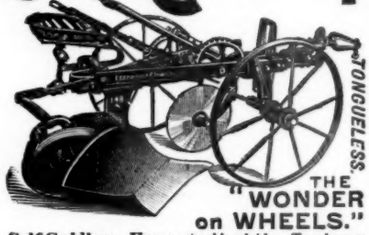

THE "WONDER on WHEELS."

Self Guiding. Uses a wheel landside. Two horses instead of three. A ten year old boy instead of a plowman. No pole. No side draft. No neck weight. No lifting at corners. Easier driving. Straighter furrows and LIGHTER DRAFT than any plow on or off wheels. Equally adapted to western prairies and hard, stony ground or hillsides. Brake prevents plow running on team. Wood or steel beam. Our book "FUN ON THE FARM," sent Free to all who mention this paper.

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PUT IT IN YOUR POCKET

When you go camping, hunting, fishing or traveling on a chilly day. Ride, walk and drive with it, sleep with it when neuralgic pains or aches trouble you, quiet the nerves with its gentle heat, keep your bed or poultice warm with it, use it in the nursery for local applications of warmth. In fact, the uses for this little "World Pocket Stove" are innumerable. It is heated by carbons. No smoke, no odor. One carbon, which burns at once on applying the match, will produce a steady heat for over two hours just below the scorching point, and the expense is less than one-half cent an hour. The stove is a handsome nickel-plated article, about the size of grandfather's watch, and weighs about four ounces. To readers of the AMERICAN AGRICULTURIST the cost, postpaid, including a supply of carbons, is $1.00.

J. T. ELLIS, Manager, Box 262, Newark, N. J.

THE MARKET PROSPECTS.

(*Continued from Page* 356.)

cago $10, Toledo, St. Louis, Cincinnati $12, Baltimore and Richmond $15, Norfolk $14.50, New Orleans $16.50, Washington and Charleston $15.50, Louisville $12.50, Buffalo $13, Montreal $10.50, Pittsburg $13.25. In nine months ended March 31, the United States exported 40,500 tons of baled hay, twice as much as in the like previous period, with an average export value of $15.75 to $17.75 per ton.

Pure Extracted Honey.—Recent reports that leading beekeepers have been adulterating their honey—both extracted, and in the comb—have had a tendency to frighten consumers of that choice article. It is believed, however, that these reports are false, and the result of competition and jealousy among venders of hives and other beekeepers' supplies. Two dealers in Cleveland, O., who sold honey in producers' original packages, have been compelled to pay large fines (most of which is cost of court), for selling what further evidence is proving to be pure honey. The decisions were based on reports of chemical analysis, and it is coming to be understood that the present state of the science of chemistry is quite unable to cope with the problem of honey adulteration. In one of the cases referred to, it is reported that the injured dealer is taking process of law to recover damages, chemists having disagreed in his case.

The Holstein-Friesian Association of America.—At the annual meeting of the Holstein-Friesian Association of America recently held at Buffalo, N. Y., Mr. Thomas B. Wales failed of re-election as secretary, and was succeeded by Mr. F. L. Houghton, widely known as the editor of the *Holstein-Friesian Register*, of Brattleboro, Vt., to which place the offices of the Association have been removed from Boston. All correspondence should be addressed to the new offices. Breeders are requested to send for new blank forms to be hereafter used.

The Hen Business represented an annual value of about $100,000,000 for eggs alone, estimated at 12 cents per dozen, according to the Census of 1889. In ten years ended with the year named, the number of barnyard fowls increased 153 per cent., other fowls (that is, turkeys, geese and ducks), increased 15 per cent. and egg production 79 per cent. The best census that could be taken is necessarily far from perfect, because so few keep accounts with their hens. Every State shows a large gain in the poultry census, but the most extraordinary development is reported from the Southern States. Missouri leads the States with nearly 23 million barnyard fowl—three times what she had in 1879, while Illinois returns the largest egg production, over 60 million dozen in 1889. The Census totals for the United States thus compare:

	Poultry on hand June 1.	
	1879.	1889.
Barnyard fowls,	102,265,653	258,472,155
Other fowls,	23,234,687	26,816,545
Total fowls,	125,500,340	285,288,700
Eggs produced previous year, dozens,	456,875,080	817,211,146

Guaranteed Cattle Herd Stakes.—Always at the front, the Rhode Island State Fair Association offers guaranteed stakes for herd competition offered to the following breeds and not restricted to exhibits from the United States and Canada, but open to the world: One thousand dollars each for Ayrshires, Black Angus, Dutch Belted, Guernseys, Herefords, Holsteins, Jerseys, Shorthorns and Swiss. A grand total of $10,000, an unprecedented sum to be awarded, larger than ever offered by any other association, and should stimulate cattle men to their utmost endeavors to win these rich guaranteed stakes. The Secretary is W. W. Dexter, Providence, R. I. The State fair will be held September 17-21, 1894.

The Grass Crop of America.—When the importance of the pasture and the hay field is estimated, it is remarkable that so little attention has been given to the study and improvement of both tame and wild grasses. The annual value of the hay crop alone reaches at least four hundred millions of dollars, and if the value of the pasture grass is added to this, the total grass crop must be worth nearly a billion dollars. As the country grows older, the value of the grass land rapidly increases, and there is no more promising field for collecting and imparting useful information, than that concerned with American grasses. The agricultural colleges and experiment stations have devoted much attention to this subject, and recently the United States department of agriculture has found it necessary to secure the services of an expert, who is to devote all of his time to the study of grasses, instead of assisting in general botanical work as heretofore. Professor Frank Lamson-Scribner has been appointed to this new position of agrostologist, and has the approval and support of the most eminent botanists of America. Our present tame grasses can doubtless be much improved by careful selection, and among our wild species may be found some of great utility to the farmer.

Honey and Beeswax.—Improved methods of apiculture are directed to increasing the production of honey rather than of wax. The more general use of the extractor greatly increases the product of honey per hive, while it discourages the building of comb. Hence it is not surprising that the census should reveal no material increase in the production of beeswax during the last ten years, during which the honey product has gained nearly 150 per cent. In '79 but 12 States produced more than a million pounds of honey each, while in '90 there were 20 that produced more than that quantity—Iowa producing nearly 7,000,000, Illinois, Missouri and New York over 4,000,000, Texas, Wisconsin and California over 3,000,000 pounds. Whether the census years '79 and '89 were particularly favorable for the secretion of honey, which is an uncertain factor, does not appear. The United States imports no honey or beeswax, but in the nine months ended March 31, 1894, exported honey to the value of $117,571, or ten times as much as was shipped abroad in the like period of the previous year. The Census totals of United States production thus compare:

	Beeswax Pounds.	*Honey Pounds.*
1869,	631,129	14,702,815
1879,	1,105,556	25,741,485
1889,	1,166,543	63,894,186

Hope Never to be Without It.—I hope never to be without the AMERICAN AGRICULTURIST, the arrival of which I look forward to with great pleasure each month. It is very interesting, and abounds with much valuable information on all branches of farming. Every farmer ought to read it. C. R. MILLSMORE, Cape Colony, South Africa.

Interesting Reading and Valuable Information.—The longer I read the AMERICAN AGRICULTURIST, the more I become convinced that I cannot think of doing without it. Its pages are always full of so much interesting reading and valuable information. B. A. C. WINTER, Lyon Co., Kan.

MELLIN'S
FOR INFANTS AND INVALIDS.
TRADE MARK.
FOOD
THE ONLY PERFECT
Substitute for Mother's Milk.

Connellsville, Pa.
Gentlemen:—I have been troubled with dyspepsia for some years. I have been using Mellin's Food for some time, and find it very nourishing; being forced to live entirely on liquids, Mellin's Food is just exactly what I need. Yours truly, JAMES F. BEATTIE.

Salem, Ore.
We have a boy 9 months old who has been taking Mellin's Food for 8 months; he is healthy and happy. Mrs. MCCABE.

SEND for our book, "The Care and Feeding of Infants," mailed Free to any address.
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Fertilizers are unprofitable,
Unless they contain sufficient Potash.
Complete fertilizers should contain at least 6% of Potash.
Fertilizers for Potatoes, Tobacco, Fruits and Vegetables should contain from 10 to 15% of Potash. Farmers should use fertilizers containing enough Potash or apply potash salts, such as Muriate of Potash, Sulphate of Potash and Kainit. For information and pamphlets, address
German Kali Works, 93 Nassau St., N. Y. City.

TOPICS OF THE TIMES.

An Agricultural College at Home.—A course of study primarily designed to meet the needs of those farmers' sons who are unable to leave home to attend college, but who feel the need of the fuller knowledge of their work which the college offers, is now offered by the New Hampshire College of Agriculture and the Mechanic Arts. During the last ten years a large amount of information of the highest practical value has been published, and in the years to come more will appear. The college instructors see nearly all of this literature, and from it they intend to select that which is best suited to the needs of the student. Besides the standard books, they will use in the course the best bulletins from the experiment stations, and the best pamphlets written by practical specialists. In this way they hope to make it a progressive course along practical lines. It will be free to all, with no entrance examination or fee. The student can begin at any time; and the privileges of the course are not limited to residents of New Hampshire. Students are offered the option of working for a certificate or not, as they see fit, but they are strongly urged to do the former. Those so working will, as studies are finished, send in answers to sets of examination questions; those not so working will submit a statement that the requisite reading has been carefully done.

Each of the books and pamphlets will have a certain number of exercises, an exercise probably averaging ten pages of reading matter. The satisfactory completion of six hundred exercises will entitle the student to a certificate. It is probable that under ordinary conditions this will require about two years. Each student working for a certificate will be required to take certain general studies, such as soils, tillage, noxious insects, fungus diseases, meteorology, laws of plant growth, farm and household chemistry, fertilizers, etc., and to select at least three lines of study from a selected list. Students not working for a certificate, may select any of the above subjects they desire, but it is recommended that they pursue the prescribed lines of general reading in connection with special subjects. The cost of books will not be great. So far as possible, the college will arrange to furnish bulletins free, and books at lowest cost. It is expected that where several students live near together, the members of the faculty will be able to deliver lectures in person at occasional intervals, thus bringing the course into line with the university extension movement. Correspondence may be addressed to Prof. C. M. Weed, Secretary, Durham, N. H. The coöperation of granges, farmers' clubs, village improvement societies, and other organizations is earnestly desired, and should be heartily given.

Dynamos or Horses.—The rapid increase in cable roads and trolley-lines in the Greater New York City and its suburbs has thrown so many horses upon the market, that prices for ordinary animals are very low. This depression in the horse market is doubtless temporary, as the low prices will not only tend to limit the supply from the farms, but also to cause more horses to be used for other purposes. Added to this, the steady increase of business will constantly require more and more horses for other purposes, and the demand will increase, and the horse market consequently improve. For transferring and delivering goods, for express or mail, and for cabs, horses are an absolute necessity, and the more electric devices are used, the more horses will be required. The dynamo and the coal mine cannot supplant the horse and the grain field. The use of steam and railways has really increased the need for horses so that there are more horses in the world to-day than ever before. It is noticeable that the demand for heavy draft animals, as well as for coachers and trotters, is still active, and prices are good. It pays to breed the best horses.

The Farmer and Farm Machinery.—All farm inventions seek to eliminate, as far as possible, the man from the work of the farm. At a very moderate estimate, the farmer of to-day, with the help of machinery, exerts a productive force equal to that of three men in the days of his grandfather. In a recent *Forum*, E. V. Smalley urges that we are now in a transition period in agriculture. The farmer once made his own ax-helves, plow-handles, and flails. He split fence rails and built fences, did a little carpentry, cobbling, and blacksmithing, and sharpened his wits by many makeshifts and contrivances. His wife carried on a little factory in the house, where wool was spun, dyed, and woven, clothing was made, and the fruits were dried and preserved. Now everything is bought at the stores, and many of the little farm arts and handicrafts have departed from the rural districts. Instead of spending the evenings shelling corn by the light of a tallow candle, the farmer now reads the newspapers in the glow of a kerosene lamp, and his wife, released from the drudgery of spinning and knitting, will be found reading a book or a magazine.

Farm machinery now gives the farmer an amount of leisure unknown in the times of hand labor. Nearly all the really hard, muscular work is done by machines. This cannot be detrimental to the intellect and character of the farm population. Leisure is the golden dream of the working classes the world over, and if the modern farmer has secured release in part from the grinding toil that made of his father an old man at fifty, wrinkled and rheumatic, who shall say that he has been injured thereby in brain force or moral stamina? It is doubtful whether the next century will see any important new inventions which will further eliminate the man from the land, and do his work with cog-wheels, levers and knives. There are no more fertile regions on the globe to be conquered by civilization, and thus increase the food supply. With growth of population will come better prices for farm products. Farm life will become still more pleasant. The tendency to large farms is being checked. Better times for American agriculture are coming in the near future.

Canada's Columbian Victors.—The Wm. Weld Co., publishers of the *Farmer's Advocate*, London, Ont., and Winnipeg, Man., have just sent us a copy of an exceedingly handsome and life-like engraving, entitled, "Canada's Columbian Victors." It contains the portraits of a large group of pure-bred Ayrshire cattle that won phenomenal honors at the World's Fair, Chicago, last summer. Canadian live stock breeders and dairymen especially will appreciate the commendable enterprise displayed by the *Farmer's Advocate* in thus giving the public such a permanent memento of the success of Canada in that great prize ring. Out of $2,035 in prizes, Canadian Ayrshires won $1,885 of the premiums. It is also highly creditable to Mr. F. Brigden, who is, without doubt, the leading live stock artist in Canada. In the way of live stock portraiture we have seen nothing finer than this, the shading and grouping being artistically done, and the individual characteristics faithfully brought out. We might mention that the cattle portrayed in this engraving were from the herds of Messrs. R. Reford, St. Annes, P. Q.; R. Robertson, Howick, P. Q.; Thomas Guy, Oshawa, Ont.; W. M. & J. C. Smith, Fairfield Plains, Ont.; D. Drummond, Petite Cote, P. Q.; Thomas Irving, "Logan's Farm," Montreal, P. Q.; Joseph Yuill, Carleton Place, Ont.; William Stewart, Jr., Menie, Ont. Canada held her own at Chicago.

No More Abandoned Farms in New England.—Some years ago, at a time of unusual farm depression, when the talk about the abandoned farm, which is now so common, first began to be noised abroad, the leading New England States issued lists of such property, hoping to remedy the evil, and new editions have been issued from time to time. The word "abandoned," however, appears only in "A descriptive list of Farms in Massachusetts, Abandoned or Partially Abandoned," for these catalogues are now simply such immigration documents as are issued by the newer States. Connecticut honestly publishes "A Descriptive Catalogue of Farms for Sale." Vermont issues "A List of Desirable Farms at Low Prices," and New Hampshire urges the reader to "Secure a Home in New Hampshire." After an extended tour of inquiry, W. H. Bishop writes in the *Century* his conclusions as to the abandoned farm, declaring that it is now a pure figment of the imagination; a moving text for statisticians of a sentimental turn, and for newspaper paragraphers who have never been out to see the facts for themselves. The abandoned farm does not exist in New England. The majority of the catalogues do not omit the word "abandoned" to save the feelings of the owners, or to uphold the reputation of the State, for while it is well enough to call a spade a spade, there is no need of being so plain-spoken as to call a thing a spade, which is nothing of the sort. There is a reviving interest in farming. Most of the inquiry for country places is not from city men who wish to buy land for summer homes, a demand in which some have seen the salvation of these farms, as others have seen it in more grazing, in sheep, tame deer, apples, or wheat. The farms are being taken up by farmers for farming purposes. Many inquiries come from the West. One man, not having ready money to offer, proposed to pay for the place in bushels of wheat, at the market price, delivered at a Western railway station. It is not now so easy to prosper in the West as it once was, and many who have gone there turn back in desire to their New England birthplace. Professor Brewer, of Yale, a most hopeful writer on the subject of Eastern agriculture, asserts that there are more abandoned farms in Kansas than in New England, and that they are abandoned for better reasons. There was a "dull streak," as some put it, in farming property, three years ago, and the issue of the catalogues corresponded with the darkest moment of the depression; but the inevitable reaction set in, and it is the general testimony that ever since then, things have been very much on the mend. Of course there are farms for sale in New England, as there are everywhere, but they are not abandoned farms.

The People's Saving Bank.—It is estimated that nearly half a million houses have been built by what are known as local building and loan associations, or as coöperative banks. Each shareholder can secure only a limited number of shares, and on these he pays a small sum each month until the payments and their interest amount to the par value of the stock. This money is borrowed by shareholders, who give real estate security for it, generally a building plot upon which they are to use the loan to build a house. As the officers generally receive no salaries, each shareholder takes a personal interest in the enterprise, which is further guarded by the fact that the association is also a village improvement society. According to the recent report of the U. S. Commissioner of Labor, the first building and loan association in America was organized at Frankford, a suburb of Philadelphia, in 1831, but the movement really started from 1840 to 1850. The average age of all the associations is only a little over six years. Some States bring their building and loan associations under the same general supervision of law thrown around savings banks. New York, Massachusetts, New Jersey, Ohio, Illinois and some other States, require such associations to make annual returns in the same manner as savings banks. The total number of building associations in the United States is 5,838. Pennsylvania has the largest number, 1,079; Ohio next, 721; then Illinois, 669; Indiana, 445; New York, 418; Missouri, 366, and New Jersey, 288, and Maryland, 240. In the New England States, Massachusetts has 115; Connecticut, 15; Maine, 29; New Hampshire, 17; Vermont, 1. The net assets of the building societies all over the country exceed four hundred and fifty million dollars. Their profits are estimated at eighty million dollars. The methods of these coöperative banks might be adopted by the farmers, to make their savings of continuous use to each other.

Farm Shows for Cities.—The longing of the city dweller for the delights of rural life was well illustrated in the recent farm show held in Madison Square Garden in New York City. This, last building covers a large block, and is provided with excellent exhibition stables in the basement. The farm show contained very good representations of the striking features of country life. The live stock was in family groups as one finds them on the farm. The cows had their calves, the mares had their colts, the lambs were with their ewes, and the little pigs were with their mothers. There were goats, geese, fowl of all kinds, sheep, rabbits and other domestic animals in great numbers. The vast interior was decorated with farm products. The arena boxes were faced with straw, while suspended from the iron arches and concealing the incandescent electric lights were great sheaves of wheat, and bundles of other farm products, artistically combined. The children were delighted with all the farm animals and their young, and the ladies showed their fondness for dumb creatures by fondling the lambs, smoothing the silken coats of the prize cattle, or patting the faces of the beautiful horses. There was a farm wagon filled with garden truck, just as the gardeners drive to the large markets of the city. There were flowers and foliage plants everywhere. The children could ride on little ponies and don-

TOPICS OF THE TIMES.

keys, and be drawn by goats. Fresh milk, butter and cheese could be had at the dairy, where the dairy maids rivaled the flower girls. There were trained ponies and boxing cats, but the realistic farm animals predominated. If such shows were held in all our cities, there would be fewer false views of life, and the one-sided training of city people would be rounded out to some extent. The managers of agricultural fairs would do well to study the many novel features of this successful farm show, especially the fact that there was no race track and no racing, and that beautiful driving horses replaced the fast horses and fast people.

The Underground Weather.—Many farmers are now realizing how much the weather above ground has to do with the conditions below ground, which are favorable or unfavorable to the growth of the crops. So little is known about the very important properties of farm soils that the United States department of agriculture has established as a part of the government weather bureau, a division of agricultural soils. The work of this new division is to continue the study of the temperature and rainfall after they enter the soil and to keep a continuous record of the moisture and temperature conditions within some of the most important soil types of America. Rain and heat are of small good to the crops until they enter the soil where they can affect the roots. The work of the weather bureau is thus brought home to the farmer, which is as it should be. The very useful operations of the bureau have heretofore been of most advantage to the merchant and sailor, to the city dweller, and as the weather bureau is now charged to the farmer, it is meet that it should do something more for the farm than the foretelling of frosts and tornadoes. Professor Milton Whitney, the chief of the new division, has devoted his life to a diligent study of farm soil, and the ways in which they affect the farmer. Such welcome progress is a great advance for a national department which was formerly the congressional gift seed store.

Keeping Tuberculosis Off the Farm.—The measures to be taken by the farmer in extirpating tuberculosis from his herd, and thereafter keeping his cattle free from this dread disease, are summarized by James Law, of New York Cornell University station as follows (B. 65): Board up the partitions of the stalls at the front so that no two cows can feed from the same manger nor lick each other. Keep each suspected animal strictly in its own stall and manger. Do not let any such animal use a drinking trough or bucket in common with other animals. Avoid old milch cows and unthrifty ones, or keep them secluded from the rest of the herd. A weakness of constitution and a susceptibility to tuberculosis is indicated by a head which is narrow between the horns, by sunken eyes; deep temporal cavity back of the eyes; thin, narrow, ewe neck; small chest, which lacks both in breadth and depth; hollow flank and tendency to pot-belly; a general lack of muscle so that the limbs seem loosely attached to the body, and lighter shades of brown and yellow in particolored breeds. If, however, such animals are of high value for the dairy, and can be kept free from tuberculosis, they need not be rejected. The finest conformations of the darker colored beef breeds furnish no protection in the presence of this microbe. Purchases should not be made from a herd in which tuberculosis has appeared, or in which cattle have died within a year or two, without first resorting to the tuberculin test.

Refuse a cow with a husky or rattling cough, wheezing, hurried breathing, discharge from nose, fetid breath, hard bunches under the skin, diseased udder, swollen bones or joints, unthriftiness or a tendency to scour or bloat. Do not purchase from city, suburban or swill stables. All new or suspected cattle should be tested with tuberculin by a practitioner thoroughly acquainted with cattle and their diseases, the test to be repeated in four weeks if not satisfactory. It is well, also, to test the swine, goats, sheep, horses, rabbits, cats, dogs and fowls on suspected farms. Kill all tuberculous animals, and either boil, burn, dissolve in acid, or bury deeply in a place to which no animals have access. Thoroughly disinfect the premises, also all products of the diseased animals, and all articles used about them. Allow no consumptive person to attend cattle or other live stock, nor to prepare their food. Such vermin as rats, mice and sparrows should be exterminated when infesting a building which has at the same time harbored tuberculous animals. Tuberculosis, like many other contagious diseases, is absolutely preventable, and is allowed to continue its career of diseases because of reprehensible ignorance and criminal indifference.

A York State Miracle.

A Remarkable Story From Erieville, N. Y.

HOW MRS. WELLINGTON MILES WAS CURED OF A CHRONIC DISEASE OF TWENTY YEARS' STANDING—PHYSICIANS FAILED TO GIVE HER THE SLIGHTEST RELIEF—THE STORY IN MRS. MILES' OWN WORDS.

(From the Syracuse, N. Y., Journal.)

No tribute to the efficacy of a remedy for human ills is more valuable than that of a beneficiary who voluntarily tells the story of benefit. This is the fact in the statement hereto appended, which was secured by a representative of *The Journal* from Mrs. Wellington Miles, of Erieville, Madison county, N. Y. Mrs. Miles is a very pleasant, intelligent woman, about 45 years old, well known and highly respected in the surrounding district. Her story, while remarkable in fact, almost marvelous in its nature, is bound to carry the weight of conviction wherever it is read.

"Fourteen years ago," said Mrs. Miles, "I became afflicted with diarrhœa, which soon became chronic. What caused it I do not know. Very frequently during all this time my trouble has been very bad, so much so that I was often prostrated for a week at a time. My stomach would pain me considerably, and I would be reduced to a state of weakness so that I was unable to do my housework.

"I left nothing undone during all these fourteen years to overcome the trouble. A greater part of the time I was undergoing some kind of medical treatment. I always took unusual care of my diet, and, in fact, did everything possible to keep my system in good order.

"Dr. Levi P. Greenwood, who died last winter, and Dr. C. H. Ransom, now of Syracuse, treated me for some years for chronic diarrhœa, but they could afford me no permanent relief. I was also under the care of leading physicians both in Erieville and Syracuse, but with no better results.

"About a year ago my aunt, Mrs. William Ensign, of West Eaton, N. Y., wrote to me: 'Try Pink Pills.' She had heard of the great good they were doing, and believed they would help my husband and me. We had not much faith in proprietary remedies at that time, because we had tried so many that had failed, but nevertheless bought two boxes. After taking half a box of the pills, I began to get decidedly better. I could eat without distress, and the diarrhœa showed a marked improvement. To-day, after taking four boxes of Pink Pills, my stomach shows no sign of the old trouble, and I have been entirely free from diarrhœa for three months. This is the longest period in five years that I have not suffered from this trouble. Furthermore I have noticed a marked improvement in my general condition. My nervous system was badly shattered, but now I can stand any amount of noise or excitement.

"My husband has suffered greatly from dyspepsia for more than 20 years. He sought relief in many ways without avail. He began taking Pink Pills, and after taking one box his stomach was better than it had been in years. We have recommended Pink Pills to a number of people in this village, and cheerfully testify to the great good they have done us.

"Sworn to before me this 30th day of May, 1893.

MRS. WELLINGTON MILES.

JAMES STEVENSON, Justice of the Peace of Madison County, N. Y.

Squire Stevenson is well acquainted with Mrs. Miles, and of his own volition testified that she had never enjoyed better health than she had since taking Dr. Williams' Pink Pills.

The discoverer of Dr. Williams' Pink Pills for Pale People certainly deserves the highest tribute that pen can frame. His medicine has done more to alleviate the sufferings of humanity than any medicine known to science, and his name should be handed down to future generations as the greatest savant of the present age.

An analysis of Dr. Williams' Pink Pills shows that they contain, in a condensed form, all the elements necessary to give new life and richness to the blood and restore shattered nerves. They are an unfailing specific for such diseases as locomotor ataxia, partial paralysis, St. Vitus' dance, sciatica, neuralgia, rheumatism, nervous headache, the after effects of la grippe, palpitation of the heart, pale and sallow complexions, and all forms of weakness either in male or female. Pink Pills are sold by all dealers, or will be sent postpaid on receipt of price (50 cents a box or 6 boxes for $2.50—they are never sold in bulk or by the 100) by addressing Dr. Williams' Medicine Co., Schenectady, N. Y., or Brockville, Ontario.

"GAINED 11 POUNDS IN 15 DAYS,"

Said Hon. W. W. Kinlock, editorially in his paper, Christian County Republican, Ozark, Mo.: "I took two boxes NO-TO-BAC a year ago, it destroyed desire for tobacco, and I gained 11 pounds in 15 days. This is not a paid notice, but our experience, given in hopes that many other poor tobacco slaves may take NO-TO-BAC and be freed." A cure easily within your reach by the use of

NO-TO-BAC

because it acts directly on the nerve centres, destroys the nerve craving effects, builds up and improves the entire nervous system. Makes WEAK MEN STRONG. Many report a gain of ten pounds in ten days. You run no physical or financial risk. NO-TO-BAC sold under

OUR GUARANTEE

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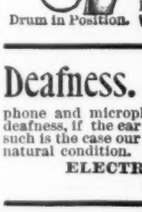

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HINTS IN SEASON.

The Season in Michigan.

A large acreage of beans and potatoes has been planted again this year. Farmers in this section have found them to be the best paying crops they can raise. Of course every farm has its wheat fields, but not so extensive as in years gone by. Oats, barley and rye are raised to a certain extent; the former are indispensable for horses, the two latter are raised mostly for feeding when ground with other grains. Rye straw, which is reckoned so valuable in the Atlantic States, is not much grown here, owing to distance from markets where it is wanted.

Sheep men are much discouraged. There is no sign of a betterment for wool, and mutton is decreasing in value steadily. In this, as in other farm products, we see the result of all rushing into a thing at once. As soon as there is a call for anything, one will see men leaving other lines of farming to put their entire capital into this. A few who are first in the field get a good return, but the business is soon overdone, the market glutted, and down go the profits. This is largely the cause of the depression in the horse market. After a few years the price will come up again. There were very few colts raised last year, and there will be fewer this year. The result is that there will be a shortage in the number of horses in a few years, and the price will be raised to correspond to the supply. Dairying is quite extensively followed in this State. Where ten years ago there was one cow, there are now five. Whether this branch of farming will be overdone remains to be seen. Certainly there are no indications of it at present. Prices have ruled higher the past year than for a long time. Especially is this true of butter.

Michigan is fast becoming cleared of her vast forests, which, a few years ago, furnished not only her own mills but those of surrounding States with logs. Thousands of acres in the northern part of the State are being stripped of timber, and thousands more have lain for years as "slashings" or land once cut over, and now left to grow up to second growth. Much of this land has been run over by fire, and presents the appearance of a ruined and desolate country. Some of it is being cleared up and cultivated, making excellent farms, while in other sections the land is so poor as to be scarcely worth the trouble of clearing it. Yet, taking it all together, Michigan is one of the richest States in agricultural resources.

E. E. ROCKWOOD, Genesee Co., Mich.

Potash and Soda.—Prof. W. F. Massey, of the North Carolina Agricultural College, writes: "An article is going the rounds of the papers which reiterates the old exploded notion that sodium compounds may replace potash in plant growth. Now if there is any one thing which the most carefully conducted experiments have proved, it is the fact that plants may get along without any soda at all, but that no green plant can make growth without potash in an available form. Soda is found more plentifully in seaside plants than anywhere else, and it was supposed that with these plants soda would replace potash, but it has been shown that even in this case the soda exists in the plant more as an accident, or because the plant could not help getting it, just as a large portion of the lime exists as a deposit on cell walls.

I have frequently seen it stated that muriate of potash made potatoes waxy, but I do not believe a word of it. The most careful experiments show that the presence of potash in the plant is absolutely essential to the promotion of starch, that no starch is made, and hence no material for structure, and no food for storage in underground parts unless potash be present. It has been shown, too, that while potash in some form must be present in order that starch may be formed, the subsequent transfer of starch to the storage reservoirs of the plant, like tubers in Irish potatoes, is best accomplished by a chloride. Now if the chloride of potassium favors the transfer of starch, how is it that the muriate of potash makes the potatoes waxy? It does nothing of the sort. In the case of sugar beets it may hinder the transformation to sugar. Experiments made upon potatoes with muriate of potash, sulphate of potash and kainit showed that the muriate gave better results than either of the others. Now, if soda was so particularly beneficial, the kainit should have given the best results, for it has more of soda than the muriate has, while the muriate, which gave the best results, did so because of the potash.

While the general opinion now is that the muriate injures the sugar product of the beet, the sulphate does not, and the sugar product of sorghum and sweet potatoes has been largely increased by use of the muriate. On lands near the seaside, where sodium would seem to be abundant, but potash is generally rather deficient, an application of potash increases the crop thirty bushels per acre, or more than the entire crop, the land would grow with all the sodium it contained. The notion that nitrate of potash can be gotten cheaply enough to use profitably as a fertilizer is new to me. I wish it were so. But really if we have plenty of phosphoric acid and a readily available form of potash, as in sulphate and muriate, why should we, for ordinary farming, pay an extra price for the nitrate when, by the aid of the other forms of potash with leguminous plants, we can get nitrates in the soil for a mere fraction of the cost of purchased nitrate?"

Preventing Sickness in the Dairy.—A subscriber in Westchester Co., N. Y., writes that he is going into the milk dairy business, and wishes to avoid everything objectionable from the start. Get young, healthy, common cows. Feed sound hay and grain. Keep the cows well supplied with pure water. Keep them out of doors as much as possible, and when stabled, keep the cows and the stables dry and clean. Cows require a great deal of pure air, and when stabled, free ventilation. In order to keep the stable floor dry, there must be proper underdraining. If the cows stand upon a short platform the droppings and urine need never soil the cow when lying down. The stables, except the platform, should receive a mixture of ground plaster and sawdust, night and morning, after a thorough cleaning and before milking, to absorb moisture and the ammonia given off from the urine.

The cows should be brushed about the side, hip and udder before milking. Never wash the udder when unnecessary, and then dry well before milking. The milking a wet udder is a filthy process at best; for, if wet, the filth, which is cow manure filth, will be sure to drop into the pail and contaminate the milk, thus forming a culture or soil for the rapid growth of bacteria. Send the milk to market as soon as aerated and cooled, for stale milk, like stale vegetables, is neither palatable nor healthful. The milk should be immediately removed from the stable, and cooled by running water in a clean and sweet place outside of the stables. The cans should be scalded with boiling water before straining the milk into them; and all pails and milk utensils must also be scalded and kept in a clean place, upside down.

Tin pails and pans should be kept in the air and sun, as the air is the best sweetener and disinfectant, and the sun is sure death to most bacteria. Clean hands, and clean linen or cotton clothing, is a necessity for a clean milk dairy. Too much stress cannot be laid upon cleanliness. The surgeon, before he operates, cleanses and disinfects himself and his instruments for the safety of the patient. The milkman should be equally careful, for uncleanly operations, twice a day in milking, may destroy the lives of many patrons.

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THE PROMISE OF THE CROPS.

The Outlook for Cereals.

The condition of winter wheat on May 1st is reported by the United States Department of Agriculture at 81.4, a reduction of 5.3 points during April. In 1893, at the same date, the condition was 75.3, a little over two points lower than the previous month. Comparisons for '92 and '91 are also given in the AMERICAN AGRICULTURIST table, and it may be added that the last three crops were respectively 396,516 and 612 millions of bushels. Comparisons of condition are specially interesting in the principal winter wheat States of Ohio, Michigan, Indiana, Illinois, Missouri, Kansas, Nebraska and California.

While the Improvement during most of April has been considerable in most of the States, the result of the cold weather in March has been shown to have been more than reported at that time. The advices from our correspondents in the States of Kansas and Nebraska indicate that the damage from the cold weather has been augmented by drouth and high winds, and much of the area has been abandoned and plowed up and put in other grain. In California, the long continued drouths, accompanied a great portion of the time by high winds, has proven very disastrous to the crop, and in many places it is said to be an entire failure in consequence. In other States, the plant is doing very well, considering the set-back caused by the cold weather.

Winter Rye, like winter wheat, has suffered a decline since last month, the average for May 1st being 90.7, against 94.4 in April. The principal rye States are New York, New Jersey, Michigan and Pennsylvania, in all of which condition seems to be about as high as usual.

Barley is Going to be High in price, if present indications of the fall sown crop count for anything. Its average condition for the whole United States is only 62.3, against 86.6 last year. California won't yield half a crop, owing to the drouth, and as that State's winter barley crop usually covers one-third the total area under barley in the country, and yields 20 out of our 80 millions of bushels of barley, the deficit is serious. The other big barley States are New York, Minnesota, Wisconsin, and Iowa, where fall sown barley promises fairly.

The Usual Breadth of Cotton.

The cotton report as consolidated by the Statistician of the Department of Agriculture for the month of May relates to the progress of cotton planting and contemplated acreage. The proportion of the proposed breadth already planted on the 1st of May was 81.6 per cent. against 85.3 per cent. last year, which is a little over four points lower than the amount usually planted at that date. The delay in Virginia, Tennessee, Arkansas and Louisiana was caused by the continued cold weather, while in Texas, planting was retarded by both late cold, and continued dry weather. Germination has been slow and growth of plant backward owing to these facts.

Some indication has been given as to the contemplated acreage, by our correspondents, as compared with that of last year. The figures relating thereto are only given to indicate what the correspondents believe to be the intentions as to acreage. The reported indication points to an acreage of 2 per cent. less than last year, though Texas will materially increase the land in cotton.

[Stated in per cents.]

Proportion of cotton area planted on May 1st.	*This year.*	*In average seasons*	*Area contempl'd comp'd '93.*	*Area contempl'd comp'd to '92*
Virginia	45	27	93	123
North Carolina	74	82	94	116
South Carolina	88	89	98	106
Georgia	86	92	98	103
Florida	95	97	89	116
Alabama	83	93	98	102
Mississippi	83	87	98	98
Louisiana	81	87	94	98
Texas	84	83	104	100
Arkansas	61	74	95	98
Tennessee	65	74	95	100

Our Foreign Trade in cotton has kept up splendidly. In spite of the previous large increase in our exports over last year, April shipments abroad were nearly as heavy as in April, 93. In eight months ended April 30, '94, the United States exported 4,783,762 bales of cotton, or 978,238 bales more than in the like period of '93, a gain of about 25 per cent. The value of these exports was $188,000,000, an increase of $24,000,000. The average export value per pound for the eight months was 7.9c for this year, 1894, against 8.6c. last year, the export value for this April being 7.6c. compared to 8.5c. in April '93. Although the United States has so enormously increased her cotton exports, the world's visible supply on May 12th was no larger than a year ago, and nearly half a million bales less than two years ago, while New York prices were half a cent less than two years ago and about the same as at the like date in '93. European and English consumption shows a heavy gain, with no great increase in stocks on hand May 1st, while United States consumption is only 225,000 bales less than last year. United States stocks are less than a year ago. Altogether, the prospect for cotton is far brighter than it was a year since.

Spring Work and Changes in Areas.

Changes in Crop Area.—Returns show a tendency to increase the area of potatoes in the East, and of corn in the South and West. Corn will, in a large measure, take the place of oats killed by the March freeze. The area of spring wheat will be somewhat reduced, owing to the low prices of the past year. A larger area of flax may be expected, especially in the Dakotas, Minnesota, Wisconsin, Nebraska and Kansas, which are the only States that grow it to any extent, these furnishing over 90 per cent. of the total crop. The movement toward diversification of production in the South is continuing. Permanent changes in the proportions of the staple crops in that section, however, will be made only by slow degrees, as, in fact, will permanent changes anywhere. Tobacco of the heavy and plug varieties, will be more largely grown, but the area of cigar leaf will be much curtailed owing to the uncertainty as to the duty on Sumatra wrappers.

Spring Plowing.—The present season has been unusually favorable to all spring work, and the proportion of plowing done on May 1st is returned as 83.5 per cent. The proportion usually completed by this date is 77.8 per cent. The present season is, therefore, nearly six points above the average. Last year 73.4 per cent. of the intended area had been plowed by May 1st; in 1892 64.6 per cent., and in 1891 68.8 per cent. only had been broken. The large table of comparative returns shows that nearly all the States are ahead of last year in plowing done, but the April and May drouth and the May cold spell are putting crops back.

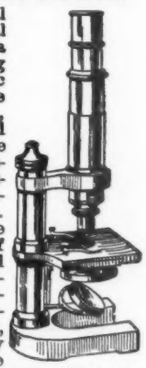
Mowing Lands and Pastures.

The Condition of Meadows or grass lands intended to be mown for hay was returned on May 1st as a trifle better than last year, standing at 91.7, against 89.2 last year, and 89.6 two years ago in May. The drouth of last year and the sudden freeze in March caused the impairment, but it has been more serious since May 1st, owing to spring drouth.

Spring Pastures.—The average condition of pastures is 92.7. This is 5.5 points higher than in May last year, and 5.3 higher than in 1892. The large table shows that the improvement was general,

(*Continued on Page* 362.)

THE MICROSCOPE.



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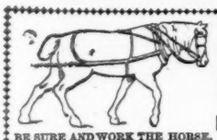

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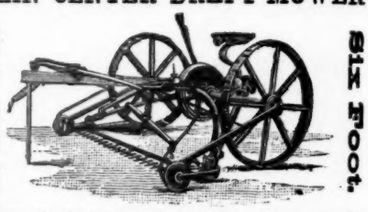
Wide Cut.  Six Foot.

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THE CONDITION OF CROPS ON MAY 1ST COMPARED WITH PREVIOUS YEARS.

By STATES, on the basis of 100 as representing perfection of condition, on May 1st in each year.	WINTER WHEAT.				WINTER RYE.			BARLEY.		GRASS LANDS.		PASTURE.		PLOWING.	
	'94.	'93.	'92.	'91.	'94.	'93.	'92.	'94.	'93.	'94.	'93.	'94,	'93.	'94.	'93.
Maine	....	....	....	....	....	....	....	....	....	101	94	100	93	59	49
New Hampshire	99	88	....	....	....	....	....	....	....	99	105	103	90	58	18
Vermont	95	93	....	....	....	....	....	....	....	102	89	103	89	62	26
Massachusetts	....	....	....	....	....	....	....	....	....	101	96	100	93	72	51
Rhode Island	....	....	....	....	....	....	....	....	....	98	89	97	90	82	52
Connecticut	....	....	90	97	98	97	95	....	....	102	92	101	90	61	83
New York	95	88	95	97	95	97	93	94	95	96	90	98	87	63	38
New Jersey	95	101	95	97	98	99	95	....	....	90	89	89	87	80	67
Pennsylvania	90	88	85	97	90	92	86	93	86	87	87	89	85	82	74
Delaware	95	100	91	93	100	100	90	....	....	90	90	90	90	75	92
Maryland	93	97	90	95	95	92	90	....	....	93	84	94	87	96	91
Virginia	84	85	86	96	89	90	88	....	89	82	84	82	82	75	94
North Carolina	75	96	94	97	83	97	93	....	90	76	91	76	89	94	93
South Carolina	72	94	94	97	83	90	95	....	100	77	82	80	87	92	92
Georgia	76	94	95	96	91	96	97	....	96	80	96	79	92	89	91
Florida	....	....	....	....	....	....	....	....	....	100	91	95	95	87	82
Alabama	82	96	90	93	87	100	95	....	100	81	94	81	93	91	90
Mississippi	86	....	88	94	90	85	85	....	....	88	95	89	85	84	93
Louisiana	....	....	....	....	....	....	....	....	....	99	98	96	99	84	90
Texas	82	74	91	95	60	47	88	70	85	89	78	83	80	94	95
Arkansas	94	100	91	98	87	97	94	....	....	93	98	91	98	86	89
Tennessee	70	91	80	98	85	93	93	79	83	83	94	79	95	83	91
West Virginia	93	88	86	97	98	87	90	....	80	91	90	89	91	85	78
Kentucky	81	88	90	90	92	96	90	88	97	88	95	85	93	81	80
Ohio	90	88	75	97	92	91	82	92	94	94	93	95	92	83	57
Michigan	83	71	84	99	91	80	90	87	....	89	88	96	82	69	42
Indiana	90	79	85	99	95	87	87	100	91	92	96	93	95	77	40
Illinois	89	62	86	99	95	72	88	92	66	88	89	89	89	80	47
Wisconsin	74	95	67	....	94	96	84	100	....	96	91	99	87	78	65
Minnesota	79	80	62	....	97	90	80	90	....	101	88	102	85	79	43
Iowa	84	70	74	....	93	85	85	101	....	95	91	97	89	89	70
Missouri	83	72	74	99	91	78	71	93	51	88	92	88	89	86	67
Kansas	75	51	80	99	77	50	90	77	45	88	72	90	70	78	78
Nebraska	59	64	98	....	80	81	99	85	....	90	78	91	78	80	72
South Dakota	....	....	....	....	....	....	....	....	....	100	89	92	81	78	70
North Dakota	....	....	....	....	....	....	....	....	....	97	91	96	90	76	75
Montana	94	91	....	....	....	....	....	....	....	100	76	103	79	31	51
Wyoming	....	100	....	....	....	....	....	....	....	105	93	105	95	14	29
Colorado	70	87	98	....	....	94	....	....	....	93	89	86	78	56	66
New Mexico	90	80	96	....	....	83	....	....	....	95	75	89	63	67	67
Arizona	89	88	95	....	....	....	....	....	....	90	50	85	25	77	22
Utah	97	93	97	....	....	99	....	....	....	96	85	95	76	81	46
Nevada	94	100	....	....	....	....	....	....	....	93	87	87	87	90	67
Idaho	95	96	....	....	....	....	....	....	....	102	98	110	91	50	89
Washington	90	107	98	....	....	102	98	....	....	94	81	95	82	79	84
Oregon	95	99	97	99	98	97	99	96	96	94	94	102	94	83	63
California	52	77	94	97	64	100	97	45	87	65	86	63	91	93	87
General average	81.4	75.3	84.0	97.9	90.7	82.7	88.3	92.3	88.6	91.7	89.2	92.7	87.2	83.5	73.4

THE PROMISE OF THE CROPS.

(*Continued from Page* 361.)

but it is a question whether this will compensate the injury by May's drouth.

Immense Improvement in Business must result from the great and increasing balance on the right side in the foreign trade of the United States. Our exports of produce and merchandise in April exceeded by $5,000,000, the value of our imports, while for the ten months ended with April, our exports are $228,000,000 more than our imports. Besides, we have in ten months imported $41,000,000 in gold more than we shipped abroad, and have exported net $32,000,000 in silver. Thus the country is ahead $301,000,000 on its foreign trade for the ten months ended April 30, 1894. Now in the like period a year ago, our imports of merchandise exceeded our exports by $8,560,000, our net exports of gold were $70,600,000, and our net export of silver was only $14,000,000, so that the country was behind $65,000,000. Adding this to our present favorable balance, and it will be seen that the United States is $366,000,000 better off on its foreign trade these ten months than last year. This must have great and good influence in permanently restoring better times and good business in the United States, as soon as the pending tariff uncertainty is done away with. The figures as to United States foreign trade thus compare in round millions of dollars:

Value of Merchandise in Millions of Dollars.	*April*		*Ten Months*	
	'93.	'94	'93	'94
Exported	60	64	702	774
Imported	77	60	721	546
Free imports	44	38	367	315
Dutiable imports	33	22	354	231
Gold imports	1	2	18	67
" exports	19	12	89	26
Silver imports	1	1	20	12
" exports	2	4	34	43

The Resignation of Prof. C. V. Riley.—Many years of useful activity as Entomologist of the United States Department of Agriculture has finally so impaired the health of Dr. C. V. Riley that, with a due regard for his family and for his peace of mind, he has voluntarily resigned the arduous position which he has so long and so faithfully filled with satisfaction, both to the general public and to the scientific fraternity. He still retains the honorary curatorship of the Department of Insects in the United States National Museum, in connection with which he will begin some long contemplated work of a purely scientific character, now that he is relieved from the administrative drudgery and detail of office. He has never been much in love with official life, as he found that under the most favorable circumstances now existing, there are many features connected with it which are unpleasant to one ambitious to achieve results and impatient of political methods, unnecessary red tape, or needless restrictions. It is very unfortunate that the spoils system of politics is not more fully replaced by a thorough system of appointment and advancement for merit, rather than for campaign work. The best services of many of our statesmen and scientists are now being lost to the people.

For Workers at the Anvil as Well as the Plane.—Herewith I send you subscription for two of my neighbors; one works at the anvil, the other shoves the plane, yet they find instructive and interesting matter in every number of your magazine.

WM. DAWSON, Lafayette Co., Wis.

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Export Trade in Produce.

April shipments to foreign markets compare favorably with last year. More cereals were exported, except a slight shortage in wheat. Provision exports made a big jump over last April, tallow excepted, and with a free movement in May and June, the statement for the fiscal year will compare well with 1893.

In Quantity of Cereals, nearly twice as much corn was shipped abroad in the ten months ended April 30, 1894, as in the like previous period, and this gain was kept up in April. It is almost wholly due to the excellent work which the United States Department of Agriculture is doing to introduce our maize into English and European markets. We have doubled our exports of barley, while our imports have been only one-third as much as last year, showing that the United States can grow all the barley for its own use and have a surplus for export. Oats are going abroad more freely, but rye exports are falling to their usual proportions. Wheat flour exports are well maintained, but in the grain our exports for ten months show a loss of 18½ million bushels. The quantities of cereals exported thus compare:

(Last three ciphers omitted.)

Quantities	—*April*— 1893	1894	—*Ten Months*— 1893	1894
Barley, bu.,	255	320	2,394	4,705
Corn, bu.,	4,096	7,049	34,695	57,002
Corn meal, bbls.,	20	23	230	230
Oats, bu.,	88	32	891	5,582
Oatmeal, lbs.,	220	429	4,074	7,466
Rye, bu.,	47	—	1,171	231
Wheat, bu.,	6,564	5,078	97,148	78,617
Flour, bbls.,	1,239	1,365	13,808	13,946

In Values of Cereal Exports the fall in prices accounts for a total decrease of $20,000,000 in value of cereals exported in the ten months. The export value of wheat in April was 61.8 cents per bushel, against 77.9 in April last year, a decline of over 16 cents per bushel, and a decline of 12 cents since July. The average value of whole wheat exported in the past ten months was 67.8 cents, against 80.3 cents for the like period of the previous year. The export values compare as follows:

Vals. in Thousands of Dollars.	—*April.*— 1893	1894	—*Ten Months.*— 1893	1894
Barley	122	141	1,165	2,162
Corn,	2,100	3,163	18,954	26,382
Corn meal,	52	59	682	609
Oats,	35	12	363	1,961
Oatmeal,	7	11	108	184
Rye,	32	....	808	126
Wheat,	5,113	3,138	78,006	53,283
" Flour,	5,565	5,449	63,044	58,549
Total,	13,026	11,974	163,130	143,256

Commercial and Agricultural.

Spraying for Pear Scab.—The cracking of pears from the scab fungus causes so great loss to fruit growers, that experiments with fungicides have been extensively tried by the New York State station, under the direction of S. A. Beach, the horticulturist. In these experiments, pear scab was successfully treated by dilute Bordeaux mixture containing four pounds of copper sulphate to forty-five gallons of the mixture. Comparing three treatments after the buds begin to open and before the blossoms open, with two treatments during the same period, it is still doubtful whether enough benefit may be gained from spraying after the blossoms are fully open to justify the expense of the extra treatment. In order to treat pear scab successfully, the spraying must be done thoroughly and at the right season. The benefits of the treatment extend to the tree as well as to the fruit, as shown by the increased vigor of the foliage and fruit on the sprayed trees when compared with the unsprayed trees.

American Southdown Breeders' Association.—The special premiums offered by the American Southdown Breeders' Association at the State, and also at the Provincial fairs of Canada, last year, were beneficial in increasing the interest in the Southdown breed of sheep, and the same liberal offer of the first four volumes of the American Southdown Record is made for these fairs in 1894. The conditions upon which these offerings are made, permits the winning of the premium in every State in the Union, and at the principal fairs in Canada. In addition to these premiums, the association is, at the suggestion of the secretary, and by the liberality of the Southdown Sheep Breeders' Association of England, enabled to offer at ten of the leading fairs in the United States and Canada, two sets of the first three volumes of the Southdown Flock Book of England. These are also offered on the most liberal terms, so that three sets of these books may be won at each of the fairs where the offerings are made. To secure the full benefits of this offering, breeders should see that these special premiums are announced in the premium lists for the fair of their respective States, and Provinces of Canada. The secretary is Jno. G. Springer, Springfield, Ill.

Cooking by Steam.—The advantages of cooking by steam are universally recognized, and the principal reason that this method has not come into use in every household has been the great expense of the machinery formerly necessary for its employment. With the introduction of the Beveridge automatic cooker, which is sold at but little higher prices than ordinary cooking utensils, this obstacle has been removed. Then "cookers" may be used upon any stove—coal, wood, oil or gasoline, and have so many points in their favor that our lady readers will find it to their advantage to write to W. E. Beveridge, 305 South Sharp street, Baltimore, Md., for his descriptive and illustrated circular.

Dehorning Made Easy.—Among the many contrivances for dehorning cattle which we have examined at the World's Fair, none have impressed us so favorably as the Keystone dehorning klipper, manufactured by A. C. Brosins, Cochranville, Chester Co., Pa. It has justly received a first award. While the construction of the instrument is of the simplest kind, yet it is wonderfully powerful, and acts with remarkable rapidity, so as to cause the animal as little pain as possible. It is, altogether, the most humane contrivance for dehorning that has come to our notice, and does not require any special skill or knowledge in its use.

Household Treasure.—There is nothing more truly a household treasure than a good sewing machine. To be without it is to be willfully deprived of the immense advantage of one of the greatest of all inventions. A machine once bought is a perpetual treasure. A machine which exhibits in liberal combination all the best features introduced is the Oxford sewing machine, made by the Oxford Manufacturing Company, Chicago, with lock-stitch, shuttle running light and quiet. Their Oxford, Home and Columbia machines, with attachments, were awarded the medal premium at the World's Columbian Exposition, Chicago.

A Miracle in Pianos.—It seems like the work of a miracle to bring a beautiful piano to your home and let you test it at your leisure; and more miraculous still to make the price so low that it is not a hardship to buy it. The old reliable Marchal & Smith Piano Co., of 235 East 21st St., New York, have worked this miracle in homes all over our land. It certainly is a wonder that such beautiful pianos are sold at so low a price.

A Wool Improver Wins a World's Fair Diploma.—It reads:—"Excellent in its effective destruction of insects, promotes the health of the sheep, increases the strength of the fibre and weight and lustre of the 'fleece.'" This refers to the celebrated Cooper Sheep Dip. $2.00 packet makes 100 gallons. Order of Cooper Dip Depot; 178 Michigan Street, Chicago, Ill. "Guide to Dipping" mailed free.

The Russian Government.—The Russian Government, after a thorough investigation, has bought and furnished their government breeding stables with the Perfect Impregnator sold by Specialty Manufacturing Company, Carrollton, Mo.

Catalogues Acknowledged.

JOHN S. CARTER, Syracuse, N. Y.: Illustrated catalogue of apparatus and supplies for cheese factories, creameries and dairies—a large pamphlet giving descriptions and illustrations of boilers, engines, pumps, separators, presses, vats, and everything necessary in the management of complete creameries.

HOOVER & PROUT, Avery, Ohio: Descriptive and illustrated catalogue of the famous Hoover potato digger, sorter and sprouter. This is an interesting account of how to dig potatoes at small cost as testified by a large number of farmers who are using this valuable implement.

RICKER NATIONAL NURSERY CO., Elgin, Ill.: Wholesale catalogue and price list of the Elgin Nurseries, comprising evergreen and ornamental trees and shrubs, hardy roses, fruit trees, small fruit, plants, etc. This company has purchased the entire assets of the E. H. Ricker Co. from R. M. Ireland, and now owns the nurseries heretofore in his hands as assignee.

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The Literature of Crop Pests.

During the last half century there has been a great increase in the destruction caused by crop pests. In the early history of our country there was comparatively little trouble from insect or fungus enemies, but as time went on the trouble became greater. Fruits, vegetables and grains that once were unmolested were more and more injured. Insect and other enemies were brought to our shores by ships; and as the forests and prairies were converted into cultivated fields many pests deserted their original food-plants to prey upon the improved crops. The massing together of trees or other plants gave the enemies an unlimited opportunity to multiply with the least danger from their natural enemies.

It is within comparatively recent years that investigations looking toward the control of these pests have been instituted. Early in the "Sixties" some of the States appointed official entomologists who studied insect pests and rendered efficient service in showing how to combat them. About the same time the organization of the land-grant colleges gave an added impetus to economic studies of this kind, both as to insect and fungus pests. Since then the National Department of Agriculture has, at different times, taken up the study of the various enemies, and has become the chief center of information in the country.

The most important recent movement for increasing knowledge concerning this subject was the establishment of the State experiment stations in 1888 by the passage of the Hatch bill. A large proportion of the stations organized with botanists or entomologists upon their staffs. These investigating officers have been constantly at work since and publishing the results of their own and other's studies. It is true that a large portion of the literature sent out has been mere compilation—some of it of very poor quality—but this was inevitable. The knowledge existing was vastly greater than that possessed by the farmers needing it, and it was a legitimate function of the stations to attempt the education of the people through the issuance of these bulletins. This was especially true, because there were few books satisfactorily covering the subject to which inquirers could be referred.

In considering the literature of crop pests, the publications of these stations and colleges and the national department should first receive attention. Taken as a whole, these form a vast array of books and pamphlets—chiefly the latter—in which a great many subjects are considered. They have done great good and spread broadcast a knowledge of the remarkable progress concerning the means of preventing pest injuries, which has recently taken place. Every farmer should get the bulletins from his own experiment station, and also the series of "Farmer's Bulletins" from the Department of Agriculture at Washington, D.C.

These bulletins and circulars are, from the nature of the case, more or less ephemeral publications, and are difficult to preserve in the ordinary farmer's library. Every intelligent farmer should have, in addition, at least a few books covering a wider field to which he can refer when in trouble. No books have yet been published in which the whole field of insect and fungus enemies is covered more satisfactorily from the farmer's point of view than the three books by Professor Clarence M. Weed of the New Hampshire College, namely, Insects and Insecticides, Fungi and Fungicides, and Spraying Crops. These are all recent and contain the latest information. Spraying Crops, now in its second edition and seventh thousand, was reviewed in this column recently. It contains an epitome of the whole subject of spraying. Fungi and Fungicides was also noticed in this column last month, and as it is just out, it necessarily is up-to-date. Insects and Insecticides is a practical manual concerning noxious insects and the methods of preventing their injuries. It treats of all the more important insect enemies in a popular manner, giving especial attention to remedial and preventive measures.

There are many other books which one desiring to learn something of crop pests can profitably study. The fruit grower will find Saunder's Insects Injurious to Fruits of value, and the reader interested in life-histories will find much useful information in Harris's Insects Injurious to Vegetation; Packard's Entomology for Beginners; and Packard's Common Insects, and Mrs. Treat's Injurious Insects of the Farm and Garden.

On the subject of fungus enemies there are fewer books. Professor F. Lamson-Scribner's Fungus Diseases of the Grape and other Plants is a readable little volume covering a few of the more important diseases. A similar book giving an excellent account of the nature of fungous diseases—though especially adapted for English rather than American readers—is Ward's Diseases of Plants. Smith's Diseases of Field and Garden Crops is another English book on the same general subject.

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*A more detailed list of books on these subjects is appended, any one of which will be promptly mailed, postpaid, on receipt of price by the Orange Judd Company, 52 Lafayette Place, New York.

Fungi and Fungicides. A practical manual concerning the fungous diseases of cultivated plants and the means of preventing their ravages. By Clarence M. Weed, Dc., C. Professor of Zoology and Botany, New Hampshire Agricultural College. Formulas are given for every mixture the application of which, by spraying or otherwise, has proved helpful, and exact directions are furnished for applying these fungicides, either alone or in combination with insecticides. Cloth $1, paper .50.

Spraying Crops. Why, When and How. By Clarence M. Weed, D. Sc. Second revised edition. The enemies of the principal crops are discussed, and practical directions for spraying are given. The book is illustrated by nearly fifty engravings. Paper. .50.

Harris's Insects Injurious to Vegetation: By the late Thaddeus William Harris, M. D. Octavo, 640 pages. Enlarged and improved, with additions from the author's manuscripts and original notes. Illustrated by engravings drawn from nature, under the supervision of Professor Agassiz, edited by Charles L. Flint, late Secretary of the Massachusetts State Board of Agriculture. The work is fully illustrated with 278 fine wood cuts, and eight beautiful steel plates, full-page size, containing 95 figures, 640 pages, 8vo., cloth. Colored plates, $6.50.

Insects Injurious to Fruits: By Prof. William Saunders. Treating of the variety of insects which infest our orchards, their modes of operation, and contains careful directions as to the best means of destroying them. 436 pages, with 440 illustrations. Cloth, 12mo. $2.

Entomology for Beginners: For the use of young folks, fruit growers, farmers and gardeners. By A. S. Packard, M. D., Ph.D. "Chapters on the structure, growth, metamorphosis, classification, architecture and habits of insects are followed by others on economic entomology, etc. The more important species are illustrated in their various stages of growth." Third edition, revised. 12mo., $1.75.

Packard's Our Common Insects: A popular account of the Insects of our Fields, Forests, Gardens and Houses. By A. S. Packard, Jr. 225 pages. Illustrated with four plates and 268 wood cuts. Cloth, 12mo. $1.50.

Treat's Injurious Insects of the Farm and Garden: By Mrs. Mary Treat. An original investigator, who has added much to our knowledge of both plants and insects, and those who are familiar with Darwin's works are aware that he gives her credit for important observation and discoveries. New and enlarged edition. With an illustrated chapter on beneficial insects. 296 pages. Fully illustrated. Cloth, 12mo. $2.

Insects and Insecticides: A practical manual concerning noxious insects and methods of preventing their injuries. By Clarence M. Weed, D. Sc., Professor of Entomology and Zoology, New Hampshire College of Agriculture, etc. 281 pages, with many illustrations. Cloth. 8vo. $1.25.

Packard's Half Hours With Insects: Insects of the garden, plant-house, pond and stream, field and forest. By A. S. Packard, Jr. Illustrated. Cloth, 12mo. $1.50.

Guide to the Study of Insects: And a treatise on those injurious and beneficial to crops. For the use of colleges, farm schools and agriculturists. By Alpheus S. Packard, M. D. With 15 plates and 670 wood cuts. 715 pages. Cloth, 8vo. $5.

Eberhart's Elements of Entomology: With 40 full-page plates; more than 300 figures. By Noble M. Eberhart, Ph. D., Sec. D., F. S. C. (London); Dean of the Chicago College of Science, etc. Paper, 144 pages, .35.

Fungous Diseases of the Grape and Other Plants, and Their Treatment: F. Lamson-Scribner, Professor of Botany in the University of Tennessee, etc., 134 pages. Paper .50, cloth .75.

Injurious Insects and the Use of Insecticides: A new descriptive manual of noxious insects, with methods for their repression. By Frank W. Sempers, Director of Fordhook Chemical Laboratory. A concise summary of characteristics, and especially those salient points in form, habits and life history, which may be serviceable in identifying destructive species, and in counter acting their injuries. Paper .50.

Potato Pests: Giving the most complete account of the Colorado beetle anywhere to be found, and includes all the latest discoveries as to the habits of the insect and the various means for its destruction. It is well illustrated, and exhibits in a map the spead of the insect since it left its native home. By Prof. C. V. Riley. Paper. .50.

New Books.

ANNALS OF HORTICULTURE. By Prof. L. H. Bailey.

The volume for 1893, soon to be published, will be conspicuous for its full history of horticulture at the World's Fair. The author spent most of the summer at the Exposition for the express purpose of collecting facts for this volume. This will probably be the only commentated history ever written of horticulture at the Exposition. The volume also contains a full discussion of the yields and prices of fruits, vegetables, and all other horticultural crops in North America during the year. There is a history of the orange trade, and accounts of the efforts to introduce American fruits into European markets. There is also a full set of statistics of the horticultural imports and exports of the year. Floricultural interests are well represented. There is a full account, with awards, of the World's Fair Chrysanthemum show, a list of the Chrysanthemum registry of the year, and other matters pertaining to ornamental gardening. The list of new varieties of flowers, fruits, vegetables and trees introduced in 1893, is an important feature of this volume. This series of Annals, which began in 1889, has now reached the fifth volume. Most of the back volumes can still be had. Published only by and sold by Orange Judd Company, New York. Price, postpaid, $1.

MAIZE: A BOTANICAL AND ECONOMICAL STUDY. By John W. Harshberger, Ph. D. Instructor in Botany, University of Pennsylvania. Contributions from the Botanical Laboratory of the University of Pennsylvania, Vol. I., No. 2. Sold by Secretary Biological Department, University of Pennsylvania, Philadelphia: University Press. 202 pp., il., large 8vo., paper, $1.50.

This monograph on American corn, or maize, *Zea mays*, is a complete description of the history, uses and structure of the grain popularly though erroneously known as Indian corn. Before the discovery of America by Columbus, maize was an unknown grain in Europe, Asia, Africa or Australia. As he thought the new land was the old India, he wrongly called the red men Indians, and the Maya grain Indian corn. The corn mentioned in the Bible is the British word for oats, barley, rye or wheat, as the most careful historical research finds that maize was known only to America and the red race before 1492. Maize is certainly a native of America, and everything goes to show that it originated in the high table lands near the city of Mexico, where it was first cultivated by the Maya tribes and distributed in every direction, so that white men found it everywhere in America, and soon carried this most useful grain to all parts of the world. The author's work has been so well done, that this treatise will long remain the standard authority on maize

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KANSAS STATE BOARD OF AGRICULTURE. First Quarterly Report, 1894. Containing 29 Addresses and Papers, and Discussions thereon, at the Twenty-Third Annual Meeting of the Board. F. D. Coburn, Secretary, Topeka, Kansas. 149 pp., il., 8vo., paper.

This report contains the interesting addresses delivered at the Board's last annual meeting and the valuable discussions they elicited, along with numerous instructive articles pertaining to Kansas and its conditions which are likely to be of decided encouragement not only to residents within the State, but to all people outside who either directly or indirectly have interest in its welfare and advancement. Besides the foregoing it contains a painstaking digest of detailed replies to carefully prepared lists of questions sent to about 600 reputable, experienced correspondents, chiefly farmers, who were instructed to make none but careful, unbiased answers upon crop, fruit, live stock and soil conditions as they found them.

DIRECTORY OF FLORISTS, NURSERYMEN AND SEEDSMEN OF THE UNITED STATES AND CANADA. A Reference Book, giving a list of the Florists, Nurserymen and Seedsmen, geographically and alphabetically arranged. Also a Directory of all National and Local Trade Organizations, with brief, historical sketches of the more important ones; Lists of leading Parks and Cemeteries; Statistics of the Florist, Nursery and Seed Trades from the last U. S. Census; Alphabetical lists of Roses, Chrysanthemums and Carnations in Commerce in America, with brief, accurate descriptions of each; and Practical hints to Florists on seasonable work for each week in the year. Chicago: The American Florist Co., 1894. 270 pp., 12 mo., boards, $2.

The American Florist Company has done good work in publishing this trade directory and reference book for those interested in flowers, trees or seeds. The book is prepared for actual needs and every-day use. Sold by Orange Judd Company. Price, postpaid, $2.

FRUITS AND FRUIT GROWING IN THE PACIFIC NORTHWEST. By A. E. Gipson. Published by the Author. Caldwell, Idaho. 70 pp., 12 mo., paper.

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(*Continued from Page* 364.)

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KANSAS STATE HORTICULTURAL SOCIETY. Third Biennial Report, containing the proceedings of the Annual Meetings. Edited by the Secretary, G. C. Brackett, Lawrence, Kansas. 232 pp., il., 8vo., cloth.

Kansas takes front rank among the prairie States especially adapted to the production of staple classes of fruits. Her horticulturists are very active men, and this report not only contains the fundamental principles which govern the practical workings of the art of horticulture, but also the scientific requirements for their application, presented in such plain and popular terms, that horticulturists everywhere may readily comprehend and put them intopractice. Fungous diseases are especially well treated.

AGRICULTURAL ANALYSIS. A Manual of Quantitative Analysis for Students of Agriculture. By Frank T. Addyman, B. Sc. London and New York: Longmans, Green & Co.

Advanced workers in agricultural chemistry will appreciate this well-planned laboratory handbook. It covers all the practical chemistry required for the South Kensington examination in agriculture. The mass of the information given was acquired in the laboratory of the Royal Agricultural Society of England. There are full directions for the estimation of nitrogen, and the analysis of feeding material, fertilizers and soils. Sold by the Orange Judd Company, New York. Price, postpaid, $1.75.

AGRICULTURE OF PENNSYLVANIA. Containing reports of the State Board of Agriculture, the State Agricultural Society, the State Dairymen's Association, the State Horticultural Association, and the State College. For 1893. Thomas J. Edge, Secretary, Harrisburg, Penn. 600 pp., il., 8vo., cloth.

This year book of farming in the Keystone State is, as usual, full of good things. Excellent articles are presented on potato blight, dairy rations, Texas fever, glanders, tuberculosis, injurious insects, forestry, care of farm horses, fertilizers, farmers' institutes, good roads, and new fruits—especially peaches and grapes.

THE RAILROAD QUESTION. A Historical and Practical Treatise on Railroads, and Remedies for their Abuses. By William Larrabee, Late Governor of Iowa. Chicago: The Schulte Publishing Co. 488 pp., il., 12 mo., cloth, $1.50.

Every farmer will be interested and edified by the reading of this well written volume. The author believes that the railroads should become in fact what they are in theory, highways to be controlled by the government as thoroughly and effectually as the common road, the turnpike and the ferry, or the postoffice and custom house. Sold by Orange Judd Company, New York. Price, postpaid, $1.50.

HORTICULTURE BY IRRIGATION. By A. E. Gipson, Caldwell, Idaho. With an Appendix, 1894. Sold by the Author. 146 pp., il., 12mo., cloth.

Artificial irrigation is an essential part of both agriculture and horticulture in nearly all of the western half of North America. Experience has fully demonstrated, however, that water, properly applied in any climate, is beneficial both to soil and to plant growth. This manual is a concise, practical treatise on the culture, by irrigation, of fruits, vegetables, forest and ornamental trees and plants, with lists for general planting. The various methods of irrigation are described. The book is especially adapted to the conditions prevailing in Colorado and Utah. Sold by Orange Judd Company, New York. Price, postpaid, 50c.

Other Publications.

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KANSAS AT THE WORLD'S FAIR. Report of the Kansas Board of Managers, Together with Illustrations and Descriptions in Detail of all Kansas Exhibits and Awards at the World's Columbian Exposition, 1893. Mrs. A. M. Clark, Topeka, Kan., Secretary.

AGRICULTURAL EDUCATION IN THE DISTRICT SCHOOLS. An Address by E. B. Voorhees, Professor of Agriculture, before the New Jersey State Board of Agriculture, 1894. Franklin Dye, Secretary, Trenton, New Jersey.

THE ASSIMILATION OF FREE ATMOSPHERIC NITROGEN by White and Black Mustard. Investigations at John Hopkins University by J. P. Lotsy, Ph. D. Associate in Botany. Bulletin No. 18, Office of Experiment Stations, Washington, D. C.

THE RUSSIAN THISTLE. A Brief Account of the New Pest of the Northwest, with Approved Methods of Combating the Weed. Report of the Cactus Committee. Published by Nelson Williams, State Commissioner of Agriculture and Labor, Fargo, North Dakota.

FREE POSTAL DELIVERY FOR RURAL RESIDENTS. Containing resolutions and extracts from addresses with a Working Man's Plea. Published by the New Jersey State Board of Agriculture. Franklin Dye, Secretary, Trenton, N. J.

WHEAT AND SOME OF ITS PRODUCTS. By C. L. Ingersoll, M. S., and Charles E. Bessey, Ph. D., assisted by H. H. Nicholson, M. A., and President F. S. Johnston, Nebraska Miller's Association. Being Bulletin No. 32 of the Agricultural Experiment Station of Nebraska, Lincoln, Neb. 1894.

LIST OF 5,000 VOLUMES FOR A POPULAR LIBRARY. Selected by the American Library Association, and Shown at the World's Columbian Exposition. Catalogue of "A. L. A." Library. U. S. Bureau of Education, Washington, D. C.

THE NATIONAL YOUNG FOLKS' READING CIRCLE. Annual Announcement. L. R. Halsey, Secretary, Chicago.

BRIGHT LIGHT FOR SUNDAY SCHOOLS. A Collection of New and Selected Songs. By S. W. Straub. Chicago: S. W. Straub & Co. Thirty-five cents.

AMERICAN SUFFOLK FLOCK REGISTRY ASSOCIATION. Rules of Entry and Points of Excellence. Secretary, Geo. W. Franklin, Atlantic, Iowa.

WOOL AND MANUFACTURES OF WOOL. 1894. Bureau of Statistics, Treasury Department, Washington, D. C.

THE LEAPING OUANANICHE. What it is; Where, When and How to Catch this Fish. By Eugene McCarthy. New York: Forest and Stream Publishing Company. 1894.

AGRICULTURAL EXPERIMENT STATION BULLETINS.

ARIZONA—At Tucson. Pumping water for irrigation (B. 11).

ARKANSAS — At Fayetteville. Spraying apple trees; Spraying for apple scab; Spraying for bitter rot; Prevalence in the State of apple scab and bitter rot; Variety of apples in the State reported as surest bearers; Apples adapted to all sections of the State, Arkansas seedling apples (B. 26).

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UNITED STATES DEPARTMENT OF AGRICULTURE, Washington, D. C., publishes the following:

SOME DESTRUCTIVE POTATO DISEASES. What they are and how to prevent them. By B. T. Galloway. (Farmers' Bulletin No. 15.) Describes potato blight or downy mildew, the macrosporium disease and potato scab, and gives directions for the treatment of these diseases.

LEGUMINOUS PLANTS FOR GREEN MANURING AND FOR FEEDING. By E. W. Allen. (Farmers' Bulletin No. 16). Presents the advantages of plowing under green crops of leguminous plants—clover, peas, beans, lupines, etc.—and also of using these plants as food for stock.

THE POLLINATION OF PEAR FLOWERS. By Merton B. Waite. 110 pp., il., 8vo. (Bulletin No. 5, Division of Vegetable Pathology.) A report on experiments showing the inability of most common varieties of pears to set fruit, though blossoming profusely, if insects are kept from them, or cross fertilization is by any means prevented.

AN IMPORTANT ENEMY TO FRUIT TREES. By L. O. Howard. (Circular No. 3, Second Series, Division of Entomology.) Treats of the San José scale insect, its appearance in the eastern United States, and the measures necessary to prevent its spread and to destroy it.

REPORT OF THE STATISTICIAN. Pp. 69-156. (Report No. 113 Division of Statistics). Distribution and consumption of corn and wheat; Supply and distribution of wheat for twenty-five years; Wheat crop of the world; Wholesale prices of principal agricultural products in all sections of the United States; Expense of raising wheat and corn; Production of honey and beeswax; Poultry and eggs; Dairy products; Official statistics of foreign crops; World's wool supply; Notes from United States consular officers and European agents; Domestic and transatlantic freight rates.

REPORT OF THE STATISTICIAN. Pp. 157-218. (Report No. 114, Division of Statistics): Condition of winter grain; Wheat production in census years since 1869; Farm animals—condition and losses; Increase and decrease in the number and value of farms, 1880-1890; Agricultural development in Bosnia and Herzegovina; Health of the people; The cotton crop of India for 1893-'94; Reports of United States Consular Officers; Transportation rates. Also a synopsis estimating in condensed form the condition of winter wheat and rye, and the numbers and losses of farm animals in the several States and Territories.

IMPROVEMENT OF THE ROAD SYSTEM OF GEORGIA. By O. H. Sheffield. Describes briefly the location, construction, and maintenance of roads, and presents the advantages of utilizing convict labor in improving the roads of Georgia.

ROAD-MAKING MATERIALS IN ARKANSAS. By John C. Branner. (Bulletin No. 4, Office of Road Inquiry.)

EXPERIMENT STATION RECORD, Vol. V, No. 8. Pp. 745-830. Contents: Editorial notes on the fertilizers and feeding-stuffs act of England; Article on the experiment station at Bernberg, Germany, and its methods of sand culture; Abstracts of the publications of the agricultural experiment stations and of the U. S. department of agriculture; Abstracts of reports of foreign investigations; Titles of articles in recent foreign publications; etc.

ANNOUNCEMENT relative to the functions of the Division of Agricultural Soils. (Circular No. 1, Division of Agricultural Soils.)

MONTHLY WEATHER REVIEW: A summary of the weather conditions observed throughout the United States compiled from the reports of numerous observers. Intended chiefly for meteorologists.

CHARTS OF THE WEATHER BUREAU. Size, 19 by 24 inches. Semi-daily Weather Map, showing weather conditions throughout the United States and giving forecasts of probable changes. Weather Crop Bulletin (series of 1894), reporting temperature and rainfall with special reference to their effects on crops, both weekly and monthly.

MATTERS OF BUSINESS.

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A Spoilt Broth results from an unnecessary number of cooks, so they say, and it is equally true that a despoiled customer is the product of too many price-swelling, commission-getting agents. Two people—and only two—ought to be concerned in every sale that amounts to dollars—the maker and the buyer. In this case, the maker profits just as well, and the buyer a hundred times better. The Elkhart Carriage and Harness Mfg. Co., of Elkhart, Ind., do business upon this principle—much to their own credit and to the benefit of the thousands who annually patronize them. This company has issued a large and handsome catalogue descriptive of their carriages, wagons, harness, bicycles and special agricultural implements, which is full of interest to all of our readers. Mr. W. B. Pratt, Secretary, Elkhart, Ind., will gladly send this work to all applicants enclosing four cents for postage.

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Famous Cutlery.—To those who have ever used any of the various knives manufactured by Maher & Grosh, Toledo, Ohio, it will not be surprising that there is hardly a place in the United States where their merits are not recognized, and letters commenting favorably upon them are constantly received. As a specimen we give the following written by E. T. Beall of the Summit City Printing Co., Bluefield, W. Va. "I can personally testify to the sterling qualities of the Maher & Grosh Cutlery, as I now carry a pocket-knife (Pearl handle, Congress, bought in '81 or,'82, while at Liberty, Va.), which has been in constant use ever since, and is not yet worn out. The best razor ever in my possession was bought of you about the same time.

It Pays.—It pays to read the papers, especially your own farm paper, for often in this way good business opportunities are brought to your attention. It may be you wish to secure a bargain in implements or a situation wherein you can use your spare time to good advantage, if so, it will pay you to write to the Portland Mfg. Co., of Portland, Mich., who are offering great inducements for agents to handle their washing machines and wringers, and any person who may be interested in such an article cannot do better than handle this machine, as it is sold under a positive guarantee to wash as clean as can be done on the washboard, and with a great deal less labor. For further particulars we refer you to their advertisement in last issue.

In Other Days, our ancestors used to get down on their hands and knees and sweat and grind kernels out of grain by pounding it between rocks. How methods change! Nowadays, with a portable French buhr mill made by Nordyke & Mamon Co., Indianapolis, Ind., a small boy will turn out any quantity of table meal and horse feed, and call it play. The buhrs are the secret of the machinery's excellence. This firm will mail their catalogue to readers of the AMERICAN AGRICULTURIST for the asking. It is worth having.

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A Salary, with expenses paid, will come handy to anyone who is now out of employment, especially where no previous experience is required to get the position. If you want a position, read advertisement on Page 355, headed "A Chance to Make Money."

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Fungous Diseases of Cultivated Plants

And the Means of Preventing Their Ravages.

BY CLARENCE M. WEED, D. Sc.

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Part II. Fungi Affecting Small Fruits.
Part III. Fungi Affecting Shade Trees, Ornamental Plants and Flowers.
Part IV. Fungi Affecting Vegetables.
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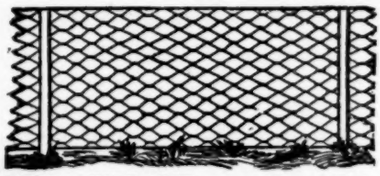

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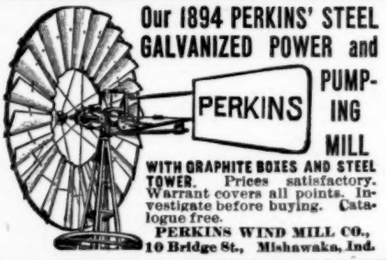

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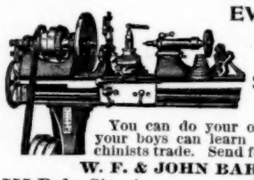

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